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ABSTRACT

This loose-leaf compendium includes three types of brief research summaries: "topical synthesis," "close-ups," and "snapshots." The single topical synthesis, by Kathleen Cotton, is entitled "Teaching Composition: Research on Effective Practices." Closeups consist of brief definitions, essential research findings, and guidelines for effective practices. The two closeups in this collection, also by Kathleen Cotton, are "Instructional Reinforcement" and "Monitoring Student Learning in the Classroom." Snapshots describe effective practices currently in place at various school districts and include the following four: "Peer Tutoring" and "Monitoring and Reinforcing Learning" (Kathleen Cotton) and "Clear, Consistent Discipline" and "Cooperative Learning" (Jocelyn A. Butler). Included in the document is a special report "Summary of Research on Class Size" (Kathleen Cotton). Annotated bibliographies are appended to each research summary. (MLF)

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1987-88

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Topical Synthesis #2

Teaching Composition: Research on Effective Practices

Kathleen Cotton

Introduction

Educators and their constituents have differing opinions as to what constitutes the "basic skills." Nearly everyone, however, would cite the "three Rs"—Reading, (w)Riting and 'Rithmetic—which have traditionally been regarded as the core of the educational program at all levels of instruction. The focus of the present report is the writing part of that core.

Given the broad general agreement about the importance of learning to write, it is disturbing to discover that "most researchers and educators agree that, with rare exceptions, students do not and cannot write well" (Amiran 1982, p. 3). In preparation for a report sponsored by the American Association of School Administrators, Neill (1982) conducted a survey of 425 school districts and found that 90 percent of the respondents considered student writing to be a problem—either a serious problem (40 percent) or a minor problem (50 percent). Neill also quoted a late 1970s report stating that the reasons given by some corporations for leaving urban environments is that they couldn't find people for clerical jobs who are minimally competent in basic skills, including writing.

Unfortunately, writing is an area characterized by considerable divergence between research and practice. Smith (1982) notes that "much is known about which practices in teaching the writing process are effective, [but] several of these findings are in conflict with widespread practices in the schools" (p. 3). For example, staff of the ERIC Clearinghouse on Reading and Communication Skills reported in 1984 that "while most authorities of writing agree that children learn to write by writing, [there is] a distressing lack of classroom time devoted to extended periods of writing" (p. 1).

Still, writing remains a critical area of the school curriculum and an important part of students' lives after school. In addition to the insistence of many employers that employees possess well-developed communication skills—including writing skills—a variety of other purposes are served by writing and developing writing capability. Graves (1978) identified several ways that writing is important in our lives:

- As a contribution to the development of a person, no matter what that person's background and talents. . . . Writing is a highly complex act that demands the analysis and synthesis of many levels of thinking.
- Writing develops initiative. In reading, everything is provided. In writing, the learner must supply everything: the right relationship between sounds and letters, the order of the letters and their form on the page, the topic, information, questions, answers, order.
- Writing develops courage. At no point is the learner more vulnerable than in writing.

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- Writing, more than any other subject, can lead to personal breakthroughs in learning.

- Writing can contribute to reading from the first day of school. Writing, some say, is active, whereas reading is passive.

- Writing contributes strongly to reading comprehension as children grow older. The ability to revise writing for greater power and economy is one of the higher forms of reading. (p. 5-6)

Ways to help students achieve these goals are discussed in a later section on composition research. To set a context for presenting this information, the next section discusses the research base concerning effective schooling in general.

The Effective Schooling Research

The effective schooling research base has grown immensely in the past two decades. During this time, a great many researchers have looked at the factors which distinguish schools and classrooms with high achieving, appropriately behaving students from those in which student achievement, behavior and affect are less positive.

While the effective schooling research has contributed greatly to our knowledge about effective instructional, managerial and environmental elements, it is limited in that most of its findings pertain to students in general and instruction in general. It remains important to ask whether these general findings pertain to particular kinds of students (e.g., a given age/grade level or special needs population) and to specific areas of the curriculum.

In 1984, the School Improvement Program (then called the Goal Based Education Program) of the Northwest Regional Educational Laboratory published a synthesis of the research on effective schooling practices. This document presents, in list form, a distillation of the findings presented in nearly 300 research documents. Organized into sections on classroom, school and district characteristics and practices, this synthesis offers a wealth of information on approaches for improving student learning and behavior.

In the Classroom Characteristics and Practices section of the synthesis, over 50 major assertions are made (and supported) concerning instructional and behavior management techniques at the classroom level. These are organized into 12 clusters having to do with such areas as expectations for student learning, monitoring student progress, and grouping students for instruction.

Looking at the effective schooling research, as outlined in the 1984 synthesis, and the research on composition reveals a high degree of congruence. Those familiar with the general effective schooling research will find nothing jarring or contradictory in the research base on effective practices in composition instruction. As the findings from the research on composition are discussed, references will be made to the ways these are corroborated by the research on effective schooling.

The Research on Written Composition

Thirty-six research documents were reviewed in preparation for this report. Sixteen were review/synthesis documents, fifteen were reports of experimental studies, two reported results of both a review and a study, one was a program evaluation document, and two reported on the same review effort. Nine of the documents concerned elementary students, another nine reported on research with secondary students, twelve had to do with the K-12 range, and two looked at the entire K-postsecondary span.

The outcome area of concern in 26 of the reports was writing achievement, either in general or as indicated by measures of syntactic maturity, fluency, various writing subskills, degree of change or degree of retention of skills over time. Seven reports presented findings on the affective outcomes of various approaches to instruction. These reported on student attitudes toward writing, self-esteem, motivation, and extent of cooperation and collaboration with others. Four studies looked at the effects of treatments on

reading comprehension as well as writing achievement.

Writing as a Process

The major general finding from the research on teaching writing is that student achievement is higher when the teaching approach emphasizes writing as a **process** rather than writing as a **product** (Parson 1985; Holdzkom, et al. 1982; Hillocks 1984, 1986; Wesdorp 1983; Amiran 1982; Keech and Thomas 1979; ERIC Clearinghouse 1984). As Parson (1985) points out, in the traditional product-oriented approach, form and correctness are the major concerns. The teacher provides drill work on specific skills, makes many of the major writing decisions for the students (topic, form, length, etc.) and serves as the sole audience/judge. Learning involves following rules, conforming to formulae, and achieving technical mastery of formal conventions and modes. Students work alone on their writing assignments, and while trying to figure out what they want to say, are reminded of such technical matters as using topic sentences and avoiding writing sentence fragments and run-ons.

Insofar as possible, the student in the product-oriented writing class tries to get it right the first time, because the paper turned in will be the only version. The teacher painstakingly marks all the mechanical errors in red ink and writes notes in the margins about the logic and clarity of the essay. Because the student will be doing nothing further with the piece, he/she often pays little attention to the teacher's comments. As Parson notes, under these conditions, there isn't much of a sense of ownership or investment in the writing.

Virtually all the various subparts of the traditional approach have been shown to be ineffective in producing capable writers. Parson identifies several reasons for the failure of this approach:

- It emphasizes form and mechanics before, and often at the expense of, ideas and meaning.
- It focuses on the product rather than the process.
- It seriously neglects the earliest stages of the writing process.
- It offers too many artificial contexts for writing.
- It isolates mechanical skills from the context of writing.
- Rather than being an outgrowth of research and experimentation, the traditional approach is based on sheer historical momentum of outmoded theoretical assumptions. (p. 9)

From the experience of classroom teachers and from the research conducted during the past 15 years, there has emerged a **process-oriented** approach to teaching writing. Recognizing that writing is a complex, recursive, dynamic, nonlinear process, experts in the field of composition have developed and tested instructional methods more in keeping with the true nature of the act of writing. Looked at this way, it becomes obvious that the process has a number of distinct stages (Parson 1985; Holdzkom, et al. 1982; Hillocks 1984, 1986; Wesdorp 1983; Applebee 1981). These include:

Prewriting. The writer gathers information and plays with ideas during the prewriting stage. Prewriting activities may include drawing, talking, thinking, reading, listening to tapes and records, discussion, role playing, interviews, problem-solving and decision-making activities, conducting library research, and so on. Research shows that students who are encouraged to engage in an array of prewriting experiences evidence greater writing achievement that those enjoined to "get to work" on their writing without this kind of preparation (Holdzkom 1982; Glatthorn 1981; Wesdorp 1983; Parson 1985).

Drafting. The writer develops his/her topic on paper (or a computer screen) during the drafting stage. Beginning may be painful and difficult, producing false starts and frustration in the writer. In the process-oriented approach, the focus in on content, not the mechanics of writing.

Revising. During this stage, the writer makes whatever changes he/she feels are necessary. Revision may involve additions and

deletions; changes in syntax, sentence structure, and organization; and in some cases, starting over completely. According to Glatthorn (1981), Wesdorp (1983) and other researchers, the revision stage is most productive of superior final products if it includes input from teachers or fellow students.

Editing. Polishing of the draft takes place in the editing stage. The writer gives attention to mechanics such as spelling, punctuation, grammar, and handwriting, and may also make minor lexical and syntactic changes.

Publication. Publication refers to the delivery of the writing to its intended audience. Sommers and Collins (1984), Smith (1982), Glatthorn (1981), Wesdorp (1983) and other investigators have found that student motivation and achievement are enhanced when student work is "published" for a larger audience than the teacher. Classmates, other students, parents and community members are among the potential audiences for students' written work.

Instructional Practices

In addition to investigating the overall process approach to writing and finding it superior to the traditional product-oriented method, researchers have also set up studies to determine the effectiveness of discrete practices used in teaching writing.

Grammar Instruction. "Perhaps the most widely ignored research finding is that the teaching of formal grammar, if divorced from the process of writing, has little or no effect on the writing ability of students" (Smith 1982). The ineffectiveness of teaching grammar in isolation from students' actual writing efforts is extremely well-documented. Amiran (1982), Bivens (1974), Glatthorn (1981), Hillocks (1984, 1986), Holbrook (1983), Holdzkom (1982), and Neill (1982) all report this finding. So do many other investigators who looked at the relative merits of traditional grammar instruction and other approaches, e.g., sentence combining. Moreover, Sealey (1987A) offers evidence that the traditional emphasis on grammar actually slows students' development as writers, because the insistence on "cosmetic correctness" inhibits them and reduces their willingness to experiment and invent.

On the other hand, Holbrook (1983), Smith (1982), Sealey (1987A) and others have shown that grammar instruction which relates directly to students' writing can enhance writing achievement. "We . . . need . . . to make a distinction between teaching writing and teaching grammar and mechanics . . . . Research tells us that grammar instruction in response to students' needs is effective in improving writing. Grammar instruction that is concrete, relevant to the students' own writing, and focused on the process of writing develops mature writers" (Sealey, 1987A, p. 2).

Sentence Combining. Of all the techniques used by teachers to foster the development of writing skills, the one receiving the most support in the research is that of sentence combining. Sentence combining instruction involves teaching students ways to embed one sentence or idea into another sentence to create sentences which are more varied and interesting, while at the same time learning a variety of syntactic patterns. "The underlying notion of sentence combining is that fluent writers use longer, more complex sentences than do less fluent writers. Through a series of guided exercises, students are shown how several short sentences may be combined into longer ones" (Holdzkom 1982, p. 64).

In experimental studies, Bivens (1974), Bruno (1981), Combs (1976), Evans, et al. (1986), Keech and Thomas (1979), McAfee (1981) and O'Hare (1973) found sentence combining practice superior to traditional grammar instruction at both the elementary and secondary levels. Some researchers, such as Evans, et al., offer evidence that younger and lower-ability students benefit even more than other students from sentence combining exercises.

Sentence combining is a good example of teaching the principles of grammar in a meaningful way, using students' own writing as the material with which to practice developing skills.

The school effectiveness literature emphasizes the importance of teachers' relating current lessons to previous ones and of reminding them of key concepts or skills previously covered (Goal Based Education Program 1984). Sentence combining instruction, with its emphasis upon building more sophisticated sentence structures from structures previ-

ously learned, exemplifies this general principle.

Providing a Language-Rich Environment. Holdzkom, et al. (1982), Keech and Thomas (1979) and other researchers and reviewers have identified the provision of a language-rich environment as a producer of positive outcomes in writing achievement. In addition to the prewriting activities cited above, researchers have found the following to to be conducive to enhancing writing motivation and skill:

- Using a letter box to increase student-teacher communication
- Journals, free writing, stream-of-consciousness writing
- Writing poetry, compiling lists, free association writing
- Genre schemes and special formats, e.g., journalistic forms and conventions
- Audio-visual stimulation, such as films, drama, photography, sculpture and dancing (Keech and Thomas 1979).

In general, practice of any of the language arts has been found to enhance facility in the others. Reading and writing skills are closely related, and researchers have found that increased reading experiences also enhance writing skill development (Bruno 1981; Stotsky 1983).

Teacher and Peer Evaluation. In traditional product-oriented writing instruction, teacher evaluation is limited to the teacher providing written commentary on the students' final product. Research conducted/reviewed by Sommers and Collins (1984), Smith (1982), Glatthorn (1981) and Wesdorp (1983) indicates that this approach is ineffective in producing writing skill gains. Students often disregard the corrections and suggestions on their returned drafts, and even if they do try to learn from these, they are often confused by vagueness and even contradictions in teacher comments. Hancock (1983) gives the example of a paper on which the teacher indicates the need for some punctuation changes in a paragraph, then in the margin indicates that the paragraph is unnecessary and should be deleted. This, notes Hancock, leaves the student to wonder if he/she is suposed to make the corrections before deleting the paragraph. Hancock suggests—and research supports—having students prepare more than one draft. Teachers (or other reviewers) should note content and organizational flaws on an early draft and lexical and mechanical errors on a later one. With young children, attention to spelling and mechanics should be de-emphasized in favor of focusing on children's communicative intent and providing plenty of opportunity for practice.

Language arts teachers are frequently overwhelmed by the sheer volume of paperwork involved in evaluating student compositions. And when research suggests, as it does, that students write more and prepare multiple drafts of each paper, teachers can understandably develop anxiety about the increased workload. Fortunately, recent research has demonstrated that **peer evaluation/tutoring/editing** can be just as effective as teacher evaluation of students' works in progress in leading to high quality final products (Amiran 1982; Beach 1979; ERIC Clearinghouse 1984; Sealey 1987B; Karegianes, et al. 1980). Peer editing, according to Sealey, allows students to practice learning to apply the mechanics and technical aspects of language. Sealey cites additional research on the benefits experienced by students who learn to evaluate one another's writing. These include:

- Learning new ideas, vocabulary, strategies of organization and style, and new attitudes in tone and voice
- Writing better, because they internalize the criteria/standards they apply to other's writing
- Relating more immediately to peer models than to professional readings and having a live audience, which helps them assume a reader's perspective as they write (p. 2).

These findings corroborate some general findings from the effective schooling research, which has repeatedly indicated the importance of students receiving feedback and correctives on their work early in and throughout the learning process; and peer input serves this purpose very effectively. In addition, peer tutoring/criticism helps fulfill the effective schooling principle of using routine assess-

ment procedures to check student progress. When such procedures are used, "students hear results quickly; reports to students are simple and clear to help them correct errors" (Goal Based Education 1984, p. 4).

Peer editing puts students into a cooperative mode, thereby fostering collaboration, self-esteem, new friendships and other benefits of cooperative learning approaches (Sealey 1987B; ERIC Clearinghouse 1984; Dickinson 1986).

Frequency and Amount of Writing. While it is clear that students require practice to become capable writers, Glatthorn (1981) and a number of other researchers point out that merely spending more time writing, or writing a greater number of papers does not in itself, increase writing skill. However, when the approach to writing instruction emphasizes process, and when the instructional techniques used are those shown to be effective, increases in amounts of writing time and practice have been shown to improve achievement (ERIC Clearinghouse 1984; Finnemore, et al. 1980; Donohue 1985; Glatthorn 1981). In effective instructional settings, says the Goal Based Education Program's 1984 synthesis report, "students have plenty of opportunity for guided and independent practice with new concepts and skills" (p. 4). The research on composition underscores the importance of providing this opportunity.

Sequenced Writing. Writing achievement can be enhanced when young writers are allowed and encouraged to use their personal experiences as the basis of their writing (Amiram 1982; ERIC Clearinghouse 1984; Wesdorp 1983). Other researchers corroborate this finding, adding that student writing skills improve when instruction follows a sequence from personal and concrete to impersonal and abstract (Neill 1982), or as expressed in the 1984 report of the ERIC Clearinghouse on Reading and Communication Skills, from personal to analytical and from thesis to logical argument.

Models. It is common practice in language arts classes to provide students with models of good writing for analysis (e.g., how a given writer uses the technique of comparison and contrast) and to "get a feel" for good writing. Research supports the use of this practice, particularly when it is used in combination with other proven instructional approaches (Finnemore 1980; Keech and Thomas 1979; Hillocks 1984, 1986; Smith 1982; Stotsky 1983; Neill 1982).

Writing Across the Curriculum. "In effective writing programs, writing is viewed as an integral part of all subjects. Such schoolwide emphasis is desirable because students will improve their understanding of the disciplines which emphasize writing, their writing will improve with opportunity for guided practice in several classrooms, students will grasp the importance of writing outside the English classroom, and effective schoolwide emphasis fosters interdepartmental cooperation" (ERIC Clearinghouse 1984). Providing language-rich environments in classrooms in all curricular areas has been shown to foster writing skill development, and some successful writing programs have included schoolwide inservice sessions to enable teachers to develop such environments (Neill 1982; Smith 1982).

Word Processing. The introduction of microcomputers into the writing curriculum has generated the same kinds of enthusiasm, resistance, controversy, and mixed results as has the use of microcomputers in other curricular areas. Proponents allege that the flexibility and amenability to change which characterize word processing programs are highly compatible with the process approach to writing. These and other arguments in favor of using microcomputers are very appealing and, indeed, research indicates that certain applications of microcomputers in writing instruction are related to increased student achievement. In their 1984 review, Sommers and Collins found that using microcomputers was effective when (1) used in conjunction with good teaching techniques which included conferences and interim evaluations and (2) used holistically (for exploration, reshaping, etc.) rather than using software which concentrated exclusively on subskills or isolates them prematurely. "Microcomputers are counter-productive when used in a theoretical vacuum" (p. 7).

Rodriguez and Rodriguez (1986) concur with this view, and they further point out that when students begin using word processing, many are frustrated in the short term. Generally, however, students grow to like the microcomputer when they gain facility in using it. Their review also included findings

that microcomputer use leads to (1) greater student willingness to prewrite and revise, (2) greater pride in their work, (3) greater willingness to experiment with words and formats and (4) greater attention to teacher and peer comments.

Virtually all the research in this area indicates that writing with microcomputers has a positive effect on student attitudes. This echoes research findings on the use of computer assisted instruction in other curricular areas and appears responsible for at least part of the beneficial effects of microcomputer use on student achievement. In addition to the positive effects on student attitudes toward writing, Dickinson (1986) found that using microcomputers to teach writing increased the amount of peer cooperation and collaboration in classrooms.

Instructional Modes

In 1984 George Hillocks, Jr. of the University of Chicago published the results of a meta-analysis of virtually all available studies on written composition conducted between 1963 and 1982. The description of the procedures and outcomes of the meta-analysis fills an entire book and will not be detailed here. However, one element worth noting is that, in addition to citing discrete instructional practices and their relative effect sizes, Hillocks gives attention to the more inclusive matter of "instructional modes" and the effects of their use on writing achievement. Hillocks describes instructional mode as "the role assumed by the classroom teacher, the kinds and order of activities present, and the specifity and clarity of objectives and learning tasks" (Hillocks 1986, p. 113). He identifies three major instructional modes found in classrooms—the presentational, natural process, and environmental modes.

The **presentational mode** of writing instruction is characterized by (1) relatively clear and specific objectives; (2) lecture and teacher-led discussion dealing with concepts to be learned and applied; (3) the study of models and other materials which explain and illustrate the concept; (4) specific assignments or exercises which generally involve initiating a pattern or following rules that have been discussed previously and (5) feedback, primarily from teachers, to students about their writing. The presentational mode is the most widespread approach to writing instruction used by teachers and the *least* effective of the three Hillocks identified and studied.

The **natural process mode** is characterized by (1) general objectives (e.g., to increase fluency and skill in writing); (2) free writing about whatever interests the students; (3) writing for audiences of peers; (4) generally positive feedback from peers; (5) opportunities to revise writing and (6) high levels of interaction among students. Hillocks' meta-analysis found this mode to be 50 percent more effective than the presentational mode.

In the **environmental mode**, instruction is characterized by (1) clear and specific objectives; (2) materials and problems selected to engage students with each other in specific processes important to some particular aspect of writing and (3) activities, such as small-group, problem-centered discussions, conducive to high levels of peer interaction concerning specific tasks. "In contrast to the natural process mode, the concrete tasks of the environmental mode make objectives operationally clear by engaging students in their pursuit through structured tasks" (p. 122). An example of such a task would be to write about one of thirty seashells so that the reader would be able to pick out the seashell written about.

The environmental mode was found to be over four times more effective than the traditional presentational mode and three times more effective that the natural process mode. This mode is also congruent with several major findings emerging from the effective schooling research. For example, both emphasize the importance of clearly delineated objectives. Both call for guided and independent practice with new skills and concepts. Both emphasize giving students practice tasks which truly match and illustrate the lesson or concept taught. And both underscore the importance of using small group structures for specific activities.

Teacher Training

Given what is known about effective instructional practices for teaching students to write,

it is reasonable to ask what research says about training teachers to implement these practices. That is, what does research say about the relationship between teacher training in these practices and student outcomes?

A great many experimental studies and program evaluations have been conducted concerning the staff development approach originally known as the Bay Area Writing Project (Neill 1982; Goldberg 1983). To shorten a long and very interesting story, this project began at the University of California at Berkeley in 1973. It involved bringing together the best writing teachers in the Bay Area schools to teach and learn from one another through a summer institute program. The success of the project occasioned the spread of the model throughout California (the California Writing Project) and across the United States (National Writing Project). Today, variations of the model can be found operating in every state.

Basically, the model involves teachers in intensive summer institute programs which immerse them in activities which reflect writing as a process. They participate in daily writing activities and sharing/critiquing sessions. This is accompanied by numerous individual conferences with their instructor. At the beginning of the school year, they begin implementation of a similar program in their classrooms which includes teachers participating in daily writing activities with their students (Neill 1982). As the year progresses, teachers participate in ongoing, voluntary staff development programs which include the following elements: (1) theory and research findings regarding effective composition instruction; (2) a focus on practical applications of theory and research; (3) attention to specific skill development; (4) time and opportunity to build writing and teaching skills; (5) opportunities to observe in other teachers' classrooms and (6) the involvement and support of administrators.

This structure is congruent with the effective schooling research, which states that in effective schools, "staff development opportunities are provided; emphasis is on skill building; content addresses key instructional issues and priorities. Inservice activities are related to and build on each other" (Goal Based Education Program 1984, p. 10).

As the number of National Writing Project sites and similar programs continues to grow, research results continue to indicate that this approach to teacher training does, in fact, result in students becoming more capable writers (Alloway 1979; ERIC Clearinghouse 1984; Neill 1982). Indeed, the approach has produced such positive outcomes that, as Goldberg (1983) writes, "the National Writing Project is arguably the most successful in-service effort in the history of teacher education" (p. 10).

While it is not necessary for staff development programs to follow or adapt the National Writing Project model in order to be effective, research does indicate that the writing-as-a-process approach and ongoing skill-building sessions are essential components of effective inservice programs.

Conclusion

When looking at the research on composition together with the effective schooling research, the following points can be made:

1. The composition research corroborates the general effective schooling research; what works in a general way also works in this specific curricular area. Some effective schooling research findings are, of course, more relevant than others to the process of teaching writing.

2. There are no instances of out-and-out contradiction between the effective schooling research and the research on teaching writing.

3. Those effective schooling research findings which are most relevant to composition instruction are those which emphasize the importance of:

    - Clarity of objectives
    - Continuity and sequencing of instruction
    - Opportunities for guided and independent practice (homework)
    - Alignment of practice activities with concepts studied

- Frequent monitoring of student learning
- Providing feedback and correctives while student work is in progress
- Small group learning for some classroom activities
- Strong instructional leadership
- Staff development which is geared to skill building and key instructional issues.

As research findings become more available to practitioners, an opportunity is created for the gap between research and practice to be closed. This would be extremely beneficial to the nation's students for many personal, academic and vocational reasons. Perhaps the most important of these reasons is that cited by writing authority Donald Graves: "In writing, kids find themselves."

References

Alloway, E., et al. *The New Jersey Writing Project*. A Consortium Project of Rutgers University, The Educational Testing Service, and Nineteen New Jersey Public School Districts, 1979. (ED 178 943).

Reports the results of a year-long writing project involving over 1,600 students in grades seven through twelve and their teachers. A 60-hour teacher training component focusing on writing as a process was followed by classroom implementation and ongoing staff development and assessment. Treatment students significantly outperformed controls.

Amiran, E., and Mann, J. *Written Composition, Grades K-12: Literature Synthesis and Report*. Portland, OR: Northwest Regional Educational Laboratory, 1982.

Presents theoretical, conceptual, research, implementation, and evaluation information drawn from an analysis of 160 documents on composition and writing instruction. Includes a summary of research on effective instructional practices.

Applebee, A. N. "Looking at Writing." *Educational Leadership* 38(1981): 458-462.

Traces the development of educators' and researchers' views of writing from a product-oriented to a process-oriented approach. Describes writing assessment issues and processes and discusses appropriate inservice activities for teaching writing.

Beach, R. "The Effects of Between-draft Teacher Evaluation Versus Student Self-evaluation on High School Students' Revising of Rough Drafts." *Research in the Teaching of English* 13(1979): 111-119.

Investigates the effect of teacher evaluation of written drafts, guided self-evaluation and non-guided self-evaluation on the writing of tenth, eleventh and twelfth graders. Treatment students' work exhibited greater degree of change and fluency and support, but no differences were noted in sequence or focus.

Bivens, W. P., III, and Edwards, A. B. *Transformational Grammar and Writing Improvement*. Paper presented at the Annual Meeting of the Conference on College Composition and Communication, 1974. (ED 101 361).

Examines the effects of sentence combining activities on the writing ability of eleventh graders. Experimental students outperformed controls (traditional instruction).

Brown, W. C., Jr. "An Investigation of the Effects of a Literacy Training on the Composition Skills of Fourth Grade Students." *Dissertation Abstracts International* 42(1982): 3430A.

Examines the effects on children's writing of teaching literary elements such as main idea, mood, imagination, use of precise nouns, etc. Treatment students (56) significantly outperformed controls (49).

Bruno, B. J. "The Effects of Sentence Combining on the Writing of Ninth Graders." *Dissertation Abstracts International* 41(1981): 4352A.

Examines the effect of sentence-combining exercises, direct writing instruction and extra reading time on the writing ability of ninth graders. The first group outperformed the second, which outperformed the third.

Combs, W. E. "Further Effects of Sentence Combining Practice on Writing Ability." *Research in the Teaching of English* 10(1976): 137-149.

Replicates previous studies on the effects of sentence combining, using a delayed rather than immediate posttest. The 100 seventh grade participants were divided into two control and two treatment classes. Treatment students outperformed controls on overall writing quality and retention.

Daker, L. P. "The Comparative Effects of Two Composition Methodologies on the Syntactic Maturity, Writing Apprehension and Overall Writing Ability of Ninth and Tenth Grade Students." *Dissertation Abstracts International* 41(1981): 4954A.

Examines the effects of sentence combining and journal writing (treatment) versus those of studying grammar, usage and models (control). Results are inconclusive, with the treatment group outperforming controls on some measures but not others.

Dickinson, D. K. "Cooperation, Collaboration and a Computer: Integrating a Computer into a First-Second Grade Writing Program." *Research in the Teaching of English* 20(1986): 357-378.

Presents a review of research on the use of microcomputers in writing programs, followed by the report of a study conducted by the author. The use of the microcomputer fostered cooperation and collaboration.

Donohue, C. *A Study of the Impact of a Special Writing Program on the Reading and Writing Achievement of Gates Students in a New York City Junior High School Remediation Program*. Ph.D. Dissertation, Columbia University Teachers College, 1985.

Studies the effect on reading comprehension and writing quality of a highly structured, time-intensive writing program for remedial seventh grade students. No significant reading comprehension differences were noted, but treatment students significantly outperformed controls in writing.

ERIC Clearinghouse on Reading and Communication Skills. *Qualities of Effective Writing Programs*. Urbana, IL: ERIC Clearinghouse on Reading and Communication Skills, 1984.

Summarizes research of effective practices in composition instruction and cites ways that administrators can foster the development of effective programs.

Evans, R.; Venetozzi, R.; Bundrick, M.; and McWilliams, E. *The Effects of Sentence Combining Instructions on Controlled and Free Writing and on Scores for Standardized Tests of Sentence Structure and Reading Comprehension*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA, 1986. (ED 269 739).

Investigates the effects of sentence combining exercises on the skill levels of college juniors, twelfth graders and sixth graders. A review of research precedes the study.

Finnemore, S. H.; Breunig, D. W.; and Taylor, R. G. "The Effect of Intensive Instruction in Writing on Ten Measures of Performance." *Reading Improvement* 17(1980): 158-162.

Examines the effects of intensive writing lessons and practice on the writing skills of seventh graders. The treatment involved more instruction, more writing practice, and contact with local authors and their work. Treatment students made significantly higher gains than controls.

Glatthorn, A. A. *Writing in the Schools: Improvement Through Effective Leadership*. Reston, VA: National Association of Secondary School Principals, 1981.

Presents information to help principals improve school writing programs through evaluation, staff development, curriculum development, supervision, involving parents, etc. Includes a summary of research findings regarding effective and ineffective approaches to teaching writing skills.

Goal Based Education Program. *Effective Schooling Practices: A Research Synthesis*. Portland, OR: Northwest Regional Educational Laboratory, 1984.

Goldberg, M. F. "Writing Objectives: The National Writing Project." *NAASP Bulletin* 67(1983): 110-111.

Describes the objectives of the Shoreham-Wading River Writing Project in New York. This project was developed based on the National Writing Project, in which half the S-WR teachers had received training.

Graves, D. H. *Balance the Basics: Let Them Write*. New York: Ford Foundation Papers on Research About Learning, 1978.

Presents research findings and instructional theory about writing in the context of other basic skills.

Hancock, K. "A Review of Research on Revision." In *Research in the Teaching of the English Language Arts*. Athens, OH: Department of English Language and Literature; Southeastern Ohio Council of Teachers of English, 1983.

Reviews research on the revision process and offers guidelines for implementing findings in the classroom.

Hillocks, G., Jr. *Research on Written Composition: New Directions for Teaching*. Urbana, IL: ERIC Clearinghouse on Reading and Communication Skills, 1986. (ED 265 552).

Examines the research conducted on written composition over a 20-year period using the techniques of meta-analysis. Both effective practices and their relative effectiveness are identified. [This report is an expansion of the information provided in Hillocks, 1984.]

_____. "What Works in Teaching Composition: A Meta-analysis of Experimental Treatment Studies." *American Journal of Education* 93(1984): 133-170.

Uses a meta-analysis technique to determine the effect sizes of the instructional practices found in over 500 experimental studies conducted between 1963 and 1982. Identifies and describes the effectiveness of various instructional modes as well as discrete instructional practices.

Holbrook, H. T. "Whither (Wither) Grammar?" *Language Arts* 60(1983): 259-263.

Provides an overview of the history of grammar instruction in the U. S. in the current century, identifies the strengths and weaknesses of such instruction, and suggests ways that teachers can effectively incorporate grammar activities in their classrooms.

Holdzkom, D.; Reed, L.; Porter, H. J.; and Rubin, D. L. *Research Within Reach: Oral and Written Communication*. St. Louis, MO: CEMREL, Inc., 1982.

Provides research-supported responses to specific questions generated by kindergarten through twelfth grade teachers. Topics include the place of communication skills in the school curriculum, classroom considerations, language diversity and evaluation.

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Karegianes, M. L.; Pascarella, E. T.; and Pflaum, S. W. "The Effects of Peer Editing on the Writing Proficiency of Low-Achieving Tenth Grade Students." *Journal of Educational Research* 73(1980): 203-207.

Investigates the effects on the achievement of 49 students of highly-structured peer editing of compositions, as opposed to teacher editing. Treatment (peer editing) students significantly outperformed controls.

Keech, C., and Thomas, S. *Compendium of Promising Practices in Composition Instruction. Evaluation of the Bay Area Writing Project*. Berkeley, CA: California University School of Education, 1979.

Identifies practices shown to be effective in the Bay Area Writing Project.

McAfee, D. C. "Effect of Sentence Combining Instruction on the Reading and Writing Achievement of Fifth Grade Children in a Suburban School District." *Dissertation Abstracts International* 42(1981): 156A.

Reports the results of a study comparing the effects of sentence-combining exercise with those produced by traditional language arts instruction. Treatment students outperformed controls on both reading and writing measures.

Melvin, M. P. *The Effects of Sentence Combining Instruction on Syntactic Maturity, Reading Achievement, and Language Arts Skills Achievement*. Oxford, OH: Miami University, 1980. (ED 191 007).

Investigates the effects of sentence-combining exercises on the reading and writing of third, fourth, fifth, and sixth graders. There were no differences between experimental and control groups.

Neill, S. B. *Teaching Writing: Problems and Solutions*. Arlington, VA: American Association of School Administrators, 1982. (ED 219 776).

Describes issues in the provision of writing instruction in elementary and secondary schools and suggests ways to address these. Includes findings from research on writing instruction.

O'Hare, F. *Sentence Combining: Improving Student Writing Without Formal Grammar Instruction*. Urbana, IL: National Council of Teachers of English, 1973. (ED 073 483).

Investigates the effects of a series of sentence-combining exercises designed to be independent of the students' (seventh graders) previous knowledge of grammar. The writing of treatment students was judged to be more mature and of higher quality than that of students who did not have the sentence-combining practice.

Parson, G. *Hand in Hand: The Writing Process and the Microcomputer. Two Revolutions in the Teaching of Writing. A Manual for Secondary Teachers*. Juneau, AK: Alaska State Department of Education, June 1985. (ED 264 598).

Provides an overview of the change from traditional to research-based writing instruction, followed by a discussion of the use of microcomputers in the writing curriculum. Teaching suggestions and a listing of resources are included.

Phelps, S. F. "The Effects of Integrating Sentence-Combining Activities and Guided Reading Procedures on the Reading and Writing Performance of Eighth Grade Students." *Dissertation Abstracts International* 40(1979): 179A.

Investigates the effects of sentence-combining exercises used with guided reading instruction on the writing performance of subjects. No significant differences were noted between treatment and control students on any of the variables studied.

Pisano, R. C. "The Effectiveness of an Intervention Study in Critical Thinking Skills Designed to Improve Written Composition in Eleventh and Twelfth Graders." *Dissertation Abstracts International* 41(1980): 192A.

Reports findings from a study designed to determine the effects on students' writing of providing them with instruction in critical thinking skills. Experimental students wrote more and higher quality essays.

Rodriguez, D., and Rodriguez, R. J. *Teaching Writing with a Word Processor, Grades 7-13*. Urbana, IL: ERIC Clearinghouse on Reading and Communication Skills and National Council of Teacher of English, 1986.

Presents research findings and implementation guidelines regarding the use of word processing programs in composition instruction. A series of lesson ideas is appended.

Sealey, J. "Grammar Instruction." *R&D Interpretation Service Bulletin* 9/1(1987): entire issue.

Presents research findings and classroom guidelines regarding the role of grammar instruction. Includes information on sentence-combining and sample exercises.

_____. "Peer Editing Groups." *R&D Interpretation Service Bulletin* 9/2(1987): entire issue.

Discusses peer editing as an effective strategy to use in composition instruction. What peer editing is, how it works, and why it is effective are outlined. Includes research findings on the effects of peer editing.

Smith, T. R., ed. *Handbook for Planning an Effective Writing Program: Kindergarten Through Grade Twelve*. Sacramento, CA: California State Department of Education, 1982.

Addresses the content and teaching methodology of writing programs, including (1) background, (2) a discussion of the writing process, (3) suggestions for implementing a schoolwide writing program, (4) staff development for teaching writing and (5) a checklist for assessing writing programs. Includes a summary of research on writing instruction.

Sommers, E. A., and Collins, J. L. *What Research Tells Us About Composing and Computing*. Paper presented to the Computer Educators League, Buffalo, NY, September 29, 1984. (ED 249 497).

Discusses the research on effective practices for teaching writing and the role of computers in fostering writing skills.

Stotsky, S. "Research on Reading/Writing Relationships: A Synthesis and Suggested Directions." *Language Arts* 60(1983): 627-642.

Reviews the research on reading and writing, offers instructional implications of that research and suggests areas for further study.

Wesdorp, Hildo. *On the Identification of Critical Variables in Written Composition Instruction*. SCO Cahier No. 16. Amsterdam: Amsterdam University, 1983. (ED 258 167).

Examines approximately 170 studies to determine the variables leading to success in written composition instruction.

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School Improvement Research Series

Close-Up #3

Instructional Reinforcement

Kathleen Cotton

Introduction

The idea that learning can be stimulated and enhanced through the use of rewards goes back at least as far as the educational practices of the ancient Greeks. Learning has always held a high place in Jewish culture, too, and edible rewards were provided to students of the Torah as far back as the twelfth century. Numerous other accounts make clear that instructional reinforcement practices have been in use throughout history.

Definitions

Before discussing the uses and effectiveness of instructional reinforcement in the modern classroom, it may be well to specify just what we mean by "reinforcement." Suppose we ask, "Does reinforcement increase the behaviors which lead to learning and thus improve learning outcomes?" This seems, at first, to be a sensible question and a worthwhile one. It turns out, however, to be something of a trick question, since psychologists define "reinforcer" as any consequence that increases the frequency of a behavior. By this definition, once we have identified something as "reinforcement," there is no longer any question as to whether it will increase a given behavior; we have already said that it will.

Clearly, this differs from the ways the terms "reinforcer" and "reinforcement" are used in most educational settings. Psychology's classical definition would not permit us to identify gold stars, candy treats, or anything else as reinforcement until we tried providing these and found that they do, in fact, increase the incidence of the desired behaviors. In educational settings, however, we frequently speak of reinforcing a behavior (such as giving correct answers) with something we imagine will be desirable (such as gold stars) before determining whether the stars are a true reinforcer of the behavior. This represents a far less rigorous use of the term reinforcement than that used by psychologists.

For present purposes, we shall define **instructional reinforcement as: the provision of verbal, symbolic, tangible or other rewards for desirable academic performance or effort at the classroom level.** This definition includes such things as:

- **Praise (and other verbal reinforcement)** - for correct responses during class discussions, accurate homework, improved test scores, etc.
- **Symbolic rewards** - such as gold stars, having one's picture on a bulletin board or name in a newsletter, etc.
- **Token rewards** - such as points or chips, which are valueless in themselves, but which can be redeemed for things of value
- **Tangible rewards** - such as edibles, toys, or school-related items (pencils, notebooks, etc.)

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- **Activity rewards** - such as free time, being leader of an activity, going on a field trip

The selection of research studies to be analyzed for this report was guided by the above definition of instructional reinforcement. Thus, the report is not concerned with other types of reinforcement often used in educational settings. There is a very large research base, for example, on the use of rewards to manage student's *behavior* and improve classroom discipline. Researchers have also looked at the effects of reinforcing students' achievement and improvement at the *schoolwide* or *districtwide* levels. Worthy as these investigations are, they have been excluded from the present analysis, so as to concentrate attention on instructional reinforcement in classrooms—usually as provided by the teacher, but also by aides, peer tutors, or even computers.

The Research on Instructional Reinforcement

CHARACTERISTICS OF THE RESEARCH

The findings reported here emerged from an analysis of 37 documents on different kinds of instructional reinforcement and their effects. Twenty-five are reports of research studies, and twelve are review/synthesis documents. Twenty documents are concerned with elementary level students, five with secondary students, and twelve with the entire elementary-secondary range. Most subjects were regular education students. Both sexes, all ability levels, and various racial and ethnic backgrounds were represented among subject groups.

The outcome areas examined were general achievement (16 reports); language arts achievement (8 reports); mathematics (9 reports); affective outcomes, such as attitude and behavior (5 reports); IQ scores (3 reports); intrinsic motiviation (3 reports); and social studies achievement (1 report). Several reports were concerned with more than one outcome area.

BACKGROUND: CHANGING VIEWS OF REINFORCEMENT

The modern history of instructional reinforcement began with the proliferation of theories and experimental work in the area of behavior modification in the 1950s and 1960s. While it is beyond the scope of this report to provide a detailed account of the various behavioral theories of learning introduced or refined during this time, it is worth noting that this was a very active period for behavioral psychology. A great many studies were undertaken and many theories were advanced regarding the use of reinforcement to manage animal and human behavior.

While enthusiasm ran high regarding the proposed applications of behavior modification techniques, most educators and psychologists now believe that the potential applications of behavior modification were oversold. For one thing, behavior modification theorists showed little restraint in generalizing findings from animal studies to human behavior. In addition, the use of many behavior modification techniques was determined to be unfeasible in educational settings.

The late 1960s and early 1970s saw something of a backlash. Many educators began to express strong criticisms of the use of reinforcement techniques in educational settings. Some argued that providing social and particularly material reinforcements gives students the wrong message about learning; that these extrinsic payoffs communicate that the learning activities are not worthwhile in themselves. Others claim that providing reinforcements undermines intrinsic motivation and that whatever achievement gains result from using them are lost once reinforcement is withdrawn.

The classroom managment and effective schooling research of the 1970s and 1980s has helped to clarify the uses and effects of instructional reinforcement and to resolve some of the issues raised by its critics.

RESEARCH FINDINGS

Does instructional reinforcement raise student achievement? Are some types of reinforcements more effective than others in

promoting achievement gains? Is reinforcement which is **contingent** on academic performance superior to **noncontingent** reinforcement (i.e., reinforcement provided for merely showing up or for participating in a classroom activity)? Are the learning gains achieved through the use of reinforcement techniques likely to be maintained? What effects are produced by criticism? Findings concerning these and other questions are listed below by the major subject areas investigated in the research.

The Effects of Reinforcement on Academic Achievement

What does research say about the effects of reinforcement in general on students' academic achievement? Findings include:

- Contingent reinforcement is positively related to achievement.
- Noncontingent reinforcement is unrelated to achievement in most cases; however, there is evidence that low-ability and younger (primary) children receive some academic benefit from noncontingent, socially motivated praise.
- Acknowledging correct responses as such is positively related to achievement.
- Reinforcements are most effective when clearly linked to students' progress toward goals.
- Achievement benefits accrue at the same rate whether students only receive rewards for correct answers, or both receive rewards for correct answers and lose them for incorrect answers ("response cost").
- Instructional reinforcement alone produces achievement benefits equal to those produced by a combination of instructional and behavioral reinforcement.

Praise and Other Verbal Reinforcement

Praise is the type of reinforcement most commonly used by teachers. Until fairly recently, it was assumed that praise has reinforcing effects on students' academic performance. More recent research, however, indicates that praise may be helpful, neutral, or detrimental, depending on the kind of praise it is and the context in which it is delivered. Findings include:

- Teacher praise does not necessarily reinforce learning, nor is it always intended to do so. Various other reasons, such as a desire to fill students' emotional needs or manage their behavior, frequently motivate praise.
- Praise can enhance learning if it is contingent, specific, sincere, and credible.
- Teachers whose students achieve most are sparing rather than effusive in praising correct answers.
- Greater achievement gains are noted when praise is delivered privately than when it is given in public.
- Greater achievement gains occur when the interactions in which praise is given are initiated by teachers rather than by students.
- When students are praised for their present progress relative to past performance, greater achievement gains result than when they are praised relative to the performance of their classmates.
- Noncontingent praise is negatively related to achievement for high-ability students.
- Praising students who answer correctly in class discussions is often intrusive and distracting, and may even embarrass the recipient.
- When correct responses are acknowledged as such ("Yes," "Correct," "That's right") achievement benefits result.
- *Basic feedback* involves telling students if their response is correct and, if incorrect, supplying the correct answer. *Elaborated corrective feedback* involves providing students who have answered incorrectly with a series of rules or prompts that will enable them to arrive at the correct answer. Both kinds of feedback produce greater achievement gains than no feedback, and elaborated corrective feedback produces greater gains than basic feedback.

Relative Effectiveness of Reinforcement Methods

Research is inconclusive about the relative effectiveness of different reinforcement methods. Well-designed studies can be cited which indicate the superiority of each major reinforcement technique (verbal, token, symbolic, activity, and tangible) over the others. The annotations accompanying the Key Studies and Reviews at the end of this report indicate which studies support the use of which techniques.

In addition to the studies which favor a particular reinforcement technique, there are also quite a number of studies which compared two or more reinforcement methods and found no difference. Several revewiers of the research on reinforcement also concluded that no one technique is best in all situations. Looking at the research as a whole, therefore, little can be said about the relative effectiveness of different methods. Conclusions are limited to:

- Contingent, verbal reinforcement is more effective than other methods for older students.
- Whether immediate or delayed reinforcement is more effective is mainly a matter of the developmental level of the recipient. Young children respond best to immediate reinforcment, while older students respond equally well to immediate and delayed reinforcement.

Differential Effects of Reinforcement with Different Kinds of Students

Do student characteristics influence the effectiveness of different kinds of reinforcement? Findings include:

- Noncontingent social reinforcement and praise are positively related to achievement for primary-age students, low-ability students, and many students from low SES backgrounds.
- Students with an external locus of control (those who believe that their actions are determined more by outside events and other people than by themselves) perform better with tangible reinforcement than with verbal reinforcement or with no reinforcement.
- Internal locus of control students perform equally well with different kinds of reinforcers.

Cooperative Rewards

Some studies investigated the effects of group reward structures on achievement. Researchers have found:

- When students are reinforced and rewarded for group academic performance, their achievement is equal to that of students reinforced for their individual academic performance.
- In addition to the achievement benefits of cooperative reward structures, students have also demonstrated increases on measures of mutual concern and positive race relations.

Other Effects of Reinforcement

Researchers who study the effects of academic reinforcement are usually most interested in measuring effects on achievement. Some, however, are also concerned with other outcome areas. Findings from this research include:

- When students are reinforced (by any means) for learning achievement, their on-task behavior increases and disruptions are minimized.
- A combination of reinforcement and corrective feedback is positively related to positive attitudes toward learning, toward particular subject areas, and toward teachers.
- Contingent reinforcement is positively associated with increases on measures of self-efficacy (internal locus of control).
- The behavioral improvements noted in response to reinforcing students for learning achievements tend to persist after the removal of the reinforcers.

Criticism, Response Cost, and Other Negative Incentives

Researchers interested in the effects of reinforcing learning achievements have sometimes also investigated the effects of "punishing" learning failures. One such "punishment" is criticism. Another is "response cost" structures, in which students lose points, tokens, or other valuables for incorrect responses in class discussions or on tests. Findings include:

- The incidence of criticism in classrooms, as noted by researchers in observational studies, is quite low.
- Criticism can be positively related to achievement for high-ability students if it is contingent, specific, and relatively infrequent.
- For students generally, criticism is unrelated to achievement.
- Response cost structures alone are unrelated to achievement; a combination of reinforcement and response cost is positively related to achievement.

Alleged Negative Effects of Reinforcement

Some researchers and reviewers have undertaken investigations of the charges made against the use of instructional reinforcement, e.g., the allegation that intrinsic motivation will be undermined, or that changes brought about through the use of reinforcement disappear when the reinforcement is withdrawn.

The research on these issues is inconclusive. Studies have found that reinforcement undermines intrinsic motivation and that it does not do so. Studies have found that the learning benefits conferred by reinforcement techniques persist when the reinforcement is taken away and that they do not persist. The effects produced seem to depend on the way that reinforcement is delivered. Findings include:

- Reinforcers of all kinds can contribute to intrinsic motivation if they are salient to the task at hand.
- Reinforcement does not undermine intrinsic motivation when the recipient perceives it as a symbol of success rather than an attempt to control his or her behavior.
- Intrinsic motivation can be undermined if students are rewarded for participation only.
- Decreases in performance quality and in intrinsic motivation following the withdrawal of reinforcement are most likely when the reinforcement has the following characteristics:
  - High salience (large or highly attractive rewards, or rewards presented in ways that call attention to them)
  - Noncontingency
  - Unnatural or unusual qualities, such as being artifically tied to behaviors rather than being natural outcomes of the behaviors

Training in Reinforcement

If certain reinforcement techniques are positively related to achievement, then can achievement be raised by providing training in reinforcement techniques to teachers and tutors? While not an extensively researched question, this was addressed by some investigators. Findings are:

- Teachers trained in the provision of verbal feedback which acknowledges correct responses and helps students answering incorrectly to arrive at correct responses have higher achieving students than those who do not receive such training.
- Providing training to student tutors in how to deliver specific, contingent verbal reinforcement is positively related to student achievement.

Noninstructional Reinforcement

While the focus of this investigation is the effects of *academic* reinforcement, some studies involved reinforcing achievement and one or more other variables. Findings include:

- When achievement is reinforced, achievement and behavior (on-task, nondisruptive) both improve; when appropriate behavior is reinforced, behavior improves, but achievement is unaffected.

- Students rewarded for simply participating achieve less than those reinforced for accurate responses and no better than those who are not rewarded at all.

Guidelines for Effective Instructional Reinforcement

Dr. Jere Brophy, professor at Michigan State University's Institute for Research on Teaching, has conducted an extensive investigation of the various kinds of teacher praise and their effects. Dr. Brophy has prepared the following guidelines for classroom use. He notes that these guidelines are also applicable to other kinds of instructional reinforcement.

Guidelines for Effective Praise[1]

Effective Praise	Ineffective Praise
1. Is delivered contingently	1. Is delivered randomly or unsystematically
2. Specifies the particulars of the accomplishment	2. Is restricted to global positive reactions
3. Shows spontaneity, and other signs of credibility; suggests clear attention to the student's accomplishment	3. Shows a bland uniformity, which suggests a conditioned response made with minimal attention
4. Rewards attainment of specified performance criteria (which can include effort criteria, however)	4. Rewards mere participation, without consideration of performance processes or outcomes
5. Provides information to students about their competence or the value of their accomplishments	5. Provides no information at all or gives students information about their status
6. Orients students towards better appreciation of their own task-related behavior and thinking about problem-solving	6. Orients students toward comparing themselves with others and thinking about competing
7. Uses students' own prior accomplishments as the context for describing present accomplishments	7. Uses the accomplishments of peers as the context for describing students' present accomplishments
8. Is given in recognition of noteworthy effort or success at difficult (for this student) tasks	8. Is given without regard to the effort expended or the meaning of the accomplishment (to this student)
9. Attributes success to effort and ability, implying that similar successes can be expected in the future	9. Attributes success to ability alone or to external factors such as luck or easy task
10. Fosters endogenous attributes (students believe that they expend effort on the task because they enjoy the task and/or want to develop task-relevant skills)	10. Fosters exogenous attributions (students believe that they expend effort on the task for external reasons--to please the teacher, win a competition or reward, etc.)
11. Focuses students' attention on their own task-relevant behavior	11. Focuses students' attention on the teacher as an external authority figure who is manipulating them
12. Fosters appreciation of and desirable attributions about task relevant behavior after the process is completed	12. Intrudes into the ongoing process, distracting attention from task-relevant behavior

[1]Excerpted from: J. E. Brophy, "Teacher Praise: A Functional Analysis." *Review of Educational Research* 51 (1981), p. 26.

In his recently published book, *Educational Psychology: Theory into Practice*, Dr. Robert E. Slavin of the Center for Social Organization of Schools at Johns Hopkins University, offers additional ideas for providing reinforcement. Intermingled with textual information, Dr. Slavin has included sections called "Teachers on Teaching," in which classroom teachers offer information from their experience on various topics. The following excerpt pertains to teachers' use of reinforcement.

Strategies for Reinforcement[2]

1. Teachers write that in their classes, the following have worked as positive reinforcers:

    - a wink, a smile, saying "I'm proud of you"
    - writing "Good job!" on test papers
    - putting brightly colored stickers on papers
    - giving a treat to each well-behaved student at the end of a class

    Kaye Cutchen, a seventh-grade teacher in Eufaula, Alabama, gives the following examples of negative reinforcement:

    > One example of reinforcement that I use involves giving vocabulary tests on Thursdays for five straight weeks. Those who have done satisfactory work those five weeks are then allowed to have the sixth week free of vocabulary assignments.

2. The Premack Principle (or Grandma's Rule) rewards children for doing things they might *not* want to do with activities they *do* like. How have you used this in your classroom?

    Ann Taylor, a specialist in the Dallas, Texas, Schools writes:

    > This works well if the reward is to be given almost immedialely. Example: "If you get all your assignments done this week, you may play box games for an hour on Friday afternoon." On long-term rewards, however, students often can't sustain the desired behavior. For example: "If you learn good self-control, we will go on a field trip next month."

    Nadine Brock, a third-grade teacher in Galloway, Ohio:

    > I use this often in my classroom. I reward students who get classroom work done and use proper classroom behavior with a special art project, a fun movie, etc.

    Other teachers mention that in their classes the following activities work as reinforcers:

    - games, including computer games
    - access to activity centers in the classroom
    - "jobs," such as cleaning chalkboards, emptying trash cans, and standing at the head of the line

In the summer of 1986, the U.S. Department of Education published a resource titled *Effective Compensatory Education Sourcebook*. One volume of the Sourcebook provided brief descriptions of Chapter 1 programs across the country which had been selected for special recognition by panels of experts in the field of compensatory education. Several projects were identified as being especially strong in their provision of regular feedback and reinforcement, one of 13 elements cited by the Secretary of Education as the major attributes of effective schooling. Excerpts from the descriptions of some of these projects appear below:[3]

- Teachers and aides enter check marks on response sheets when students master lessons. Students may accumulate these and exchange them for rewards such as certificates, pictures

[2]Excerpted from: R. E. Slavin, *Educational Psychology: Theory into Practice*. Englewood Cliffs, NJ: Prentice-Hall, 1986, p. 111.

[3]Excerpted from: P. A. Griswold, et al., *Effective Compensatory Education Sourcebook, Vol. II: Project Profiles*. Washington, DC: U.S. Department of Education, 1986, pp. 52, 74, 95, 112.

and free time. When a student attains certain skill levels, staff send home a formal letter informing parents of their child's progress. Unified School District #500, Kansas City, Kansas.

- During instruction tutors provide immediate feedback on students' work, attempting to give feedback which is specific and appropriate to the instructional matter at hand. Tutors provide positive feedback for students' effort and attitude as well as for achievement. Douglas Elementary School, Ellsworth Air Force Base, South Dakota.

- Oral, physical and written feedback on children's skill performance is provided. Teachers scrupulously avoid criticizing children's efforts or punishing them for difficulty or slowness in completing tasks. Parma Elementary School, New Madrid, Missouri.

- The project's structure allows staff to teach and reinforce specific reading and writing skills. Teachers monitor children's responses, so they can reinforce and reteach as needed. Children progress at their own pace, taking tests when they are ready. Detailed records accurately reflect students' progress toward mastering language skills. Close student monitoring and feedback/reinforcement are built-in features on the ECRI mastery learning strategy. South-Western City Schools, Grove City, Ohio.

Key Studies and Reviews

Barringer, C., and Gholson, B. "Effects of Type and Combination of Feedback upon Conceptual Learning by Children: Implications for Research in Academic Learning." *Review of Educational Research* 49, (1979): 459-478.

Reviews research that compared the effects of different kinds of feedback (verbal, symbolic, tangible) and feedback combinations on student's learning. Symbolic or verbal feedback had more powerful effects than tangible rewards.

Bear, G. C., and Richards, H. C. "An Interdependent Group-Oriented Contingency System for Improving Academic Performance." *School Psychology Review* 9 (1980): 190-193.

Investigates the effects of group contingencies (extra minutes of recess time) on the English and math achievement of students in grades 5 through 8. Subjects improved their achievement significantly over the baseline period.

Brophy, J. E. "Teacher Behavior and Its Effects." *Journal of Educational Psychology* 71 (1979): 733-750.

Discusses findings of process-product research conducted during the 1970s; also discusses methodologies used in this research and presents research trends and recommendations for research activities in the future. Includes a section on the effects of teacher praise.

_____. "Teacher Praise: A Functional Analysis." *Review of Educational Research* 51 (1981): 5-32.

Reviews classroom process research on teachers' verbal praise and its effects. Differentiates among different kinds of praise and offers recommendations to teachers.

_____, and Evertson, C. M. *Learning from Teaching: A Developmental Perspective*. Boston, MA: Allyn and Bacon, 1976.

Reports findings from the Texas Teacher Effectiveness Study on the effects of the behavior and expectations of second and third grade teachers on the achievement and attitude of their students. Focuses on teachers' classroom management, questioning patterns and use of motivational techniques in high and low SES classrooms.

_____, and Good, T. L. "Teacher Behavior and Student Achievement." In *Handbook of Research on Teaching*, edited by M. C. Wittrock. New York: Macmillan Publishing Company, 1986.

Reviews and summarizes over 200 reports of process-product research linking teacher behavior to student achievement. Includes a section on teacher praise and other verbal reinforcement.

Broughton, S. F. *Effects and Noneffects of Reinforcement for Academic Performance*. Paper presented at the Meeting of the Midwestern Association of Behavior Analysis, Chicago, IL, May 1978. (ED 186 794)

Investigates the effects on math achievement and on-task behavior of fourth graders when verbal reinforcement was provided for correct completion of math problems. Reinforced students significantly outperformed controls.

_____, and Lahey, B. B. "Direct and Collateral Effects of Positive Reinforcement, Response Cost and Mixed Contingencies for Academic Performance." *Journal of School Psychology* 16 (1978): 126-136.

Compares the effects on achievement and behavior of three positive reinforcement conditions and a control group. Treatment students outperformed controls but did not differ from one another.

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Dickinson, D. J. "But What Happens When You Take That Reinforcement Away?" *Psychology in the Schools* 11 (1974): 158-160.

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The effects of (1) verbal reinforcement of on-task behavior, (2) verbal reinforcement of accurate responses and (3) tangible reinforcers (tokens or edibles) for both on-task behavior and accurate responses were investigated. Verbal reinforcement of accurate responses was positively and significantly related to achievement. Other treatments were unrelated.

Good, T. L., and Brophy, J. E. *Looking in Classrooms* (3rd ed.). New York: Harper and Row, 1984.

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Examines the effects of praise and corrective reinforcers on the achievement of urban, low SES males in grades 1-3, 6-7 and 11-12. The effectiveness of praise was found to decrease with grade level, while the effectiveness of corrective reinforcers increased with grade level.

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Investigates the effects on academic achievement and classroom behavior of providing tokens (which could be redeemed for toys) for appropriate behavior and correct work. Subjects were boys 9-12 in a psychiatric hospital. When rewarded for appropriate behavior, behavior improved but achievement did not change. When rewarded for achievement, both achievement and behavior improved.

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Medley, D.M. *Teacher Competence and Teacher Effectiveness: A Review of Process-Product Research*. Washington, D.C.: American Association of Colleges for Teacher Education, 1977. (ED 143 629)

Analyzes and synthesizes the results of nearly 300 studies on teacher competence/effectiveness. Over 600 process-product relationships are displayed in a series of tables.

Michaels, J.W. "Classroom Reward Structures and Academic Performance." *Review of Educational Research* 47 (1977): 87-98.

Synthesizes the findings of studies comparing group and individual contingency reward systems and group and individual competition structures.

Rosenshine, B. "Teaching Functions in Instructional Programs." *Elementary School Journal* 83 (1983): 335-351.

Reviews research on effective teaching practices, with special attention to the content of inservice programs which were attended by successful teachers.

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Reviews research on teacher behavior—student outcomes relationships. Immediate feedback which incorporates praise is identified as a teaching behavior which promotes achievement.

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Drawing on research concerning the provision of teacher training in effective instructional techniques, the authors identify major teaching functions and discuss them in detail.

Slavin, R.E. "Cooperative Learning." *Review of Educational Research* 50 (1980): 315-42.

Summarizes the results of 28 studies on the effects of cooperative learning techniques on student achievement and affective outcomes.

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Studies the effects of different task structures and reward structures and of a focused schedule of instruction on student outcomes.

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Reviews literature on cooperative, competitive, and individual reward structures in terms of their effect on academic achievement.

Stallings, J.A. *Changing Teacher Behavior: A Challenge for the 1980's.* Paper presented at the Annual Meeting of the American Educational Research Association, Los Angeles, CA, 1981. (ED 200 596)

Teachers were trained in classroom behaviors which research had shown to be positively related to student achievement. Students of trained teachers outperformed control students. Reinforcement through provision of supportive feedback was one strategy shown to be effective.

Stewart, L.G., and White, M.A. "Teacher Comments, Letter Grades, and Student Performance: What Do We Really Know?" *Journal of Educational Psychology* 68 (1976): 488-500.

Reviews studies on the relative effects of different combinations of letter grades and types of written comments; then the results of a study conducted by the authors are reported.

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Reviews research on the effects of teacher praise, criticism, and ignoring on achievement and classroom behavior.

Thompson, L.J. *A Survey of Reinforcement Preferences. Research Bulletin Number 3.* Churchlands, Australia: Churchlands College of Advanced Education, 1978. (ED 164 473)

Examines degree of congruence between preferred reinforcers of students and teachers and between students of different ages. Older students and higher-achieving students placed greater emphasis on intangible reinforcers than did younger and lower-achieving students.

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Tobin, K.G., and Capie, W. *Student Engagement in Middle School Science Classrooms.* Paper presented at the Annual Meeting of the Southeastern Association for the Education of Teaching of Science, Orlando, FL, November 1980. (ED 194 522)

Examines the relationship between teacher behaviors in junior high school science classes and student engagement rates. Higher engagement rates occured in classes where teachers reinforced students' efforts and encouraged them to maintain involvement.

Ware, B. "What Rewards Do Students Want?" *Phi Delta Kappan* 59 (1978):355-356.

Surveys high school student and teacher opinions about the desirability of 15 kinds of rewards. Both teachers and students ranked praise very low.

Winett, R.A., and Roach, A.M. "The Effects of Reinforcing Academic Performance on Social Behavior: A Brief Report." *The Psychological Record* 23 (1973), 391-396.

Investigates the effect of rewards on students' rate of completing assignments and on their classroom behavior when rewarded for assignment completion only.

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School Improvement Research Series

Close-Up #4

Monitoring Student Learning in the Classroom

Kathleen Cotton

Introduction

The body of educational research literature which has come to be known as the effective schooling research identifies the practice of monitoring student learning as an essential component of high-quality education. The careful monitoring of student progress is shown in the literature to be one of the major factors differentiating effective schools and teachers from ineffective ones. Indeed, those analyses which have sought to determine the relative effect sizes of different instructional practices have identified monitoring student progress as a strong predictor of student achievement.

What does "monitoring student learning" involve? The American Heritage dictionary defines monitoring as "keeping watch over; supervising" and also gives another, more specific meaning: "to scrutinize or check systematically with a view to collecting certain specified categories of data." As the term is used in educational settings, monitoring takes in both these meanings and is closely connected with the related functions of recordkeeping, reporting, and decision making.

Definition

For our purposes here we shall define monitoring as **activities pursued by teachers to keep track of student learning for purposes of making instructional decisions and providing feedback to students on their progress.** When educators speak of classroom monitoring, they generally refer to the following teacher behaviors:

- Questioning students during classroom discussions to check their understanding of the material being taught
- Circulating around the classroom during seatwork and engaging in one-to-one contacts with students about their work
- Assigning, collecting, and correcting homework; recording completion and grades
- Conducting periodic reviews with students to confirm their grasp of learning material and identify gaps in their knowledge and understanding
- Administering and correcting tests; recording scores
- Reviewing student performance data collected and recorded and using these data to make needed adjustments in instruction

Defined this way, monitoring obviously includes many kinds of activities, but it is important to note that the present analysis also excludes certain forms of monitoring. It does not address issues relating to schoolwide or district-level monitoring of student learning. It is not concerned, except incidentally,

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with monitoring students' behavior. And it provides only cursory information on such matters as teacher training in monitoring and assessment practices or the processes teachers follow in putting monitoring information to use.

Instead, the focus here is classroom-level monitoring of student learning progress and what research says about the relationships between such monitoring and the student outcomes of achievement, attitudes and social behavior.

The Research on Monitoring Student Learning

Several dozen documents were reviewed in preparation for this report. Of these, 23 are studies or reviews which clearly indicate a relationship between one or more forms of monitoring student learning and student outcomes—usually achievement. Fifteen documents are reviews and eight are studies. Five involve elementary students, three involve secondary students, and fifteen are concerned with the entire K-12 range. Fourteen have general achievement as the dependent variable. Language arts is the outcome focus of three documents. Others include: mathematics—3, science—2, social studies—1, and student attitudes—5. Some investigations were concerned with more than one outcome area. Nineteen of the studies concern regular education students of various races, socioeconomic groups, and ability levels. Three have special education subjects, and one focuses on Chapter 1 participants.

Of the kinds of monitoring functions investigated, teacher questioning to check student understanding is the focus of three reports. Others include: monitoring seatwork—4, assigning/collecting/grading homework—2, conducting periodic reviews in class—2, formative testing—2, and reviewing records—3. Nine of the reports focused on two or more of these functions.

Findings pertaining to each of these kinds of classroom monitoring—and to monitoring in general—are cited in the sections which follow.

QUESTIONING AND OTHER LEARNING PROBES

The term "learning probe" refers to a variety of ways that teachers can ask for brief student responses to lesson content so as to determine their understanding of what is being taught. Questions to the class, quizzes, and other means of calling upon students to demonstrate their understanding are methods used by teachers to find out if their instruction is "working" or if it needs to be adjusted in some way.

Does the use of learning probes have a beneficial effect on student achievement? The research indicates that this approach can indeed produce achievement benefits. Particularly effective techniques include:

- Keeping questions at an appropriate level of difficulty; that is, at a level where most students can experience a high degree of success in answering
- Paying close attention to who is answering questions during classroom discussion and calling upon nonvolunteers
- Asking students to comment or elaborate on one another's answers
- Using information on students levels of understanding to increase the pace of instruction whenever appropriate. (There is a strong positive relationship between content covered and student achievement. Monitoring can alert teachers to situations where they can profitably pick up the instructional pace and thus cover more material.)

MONITORING SEATWORK

Research comparing the behavior of effective teachers (i.e., those whose students achieve highly or higher than would be expected given background variables) with that of less effective teachers has clearly revealed the importance of monitoring the class during seatwork periods. Such monitoring involves teachers moving around the classroom, being aware of how well or poorly students are progressing with their assignments, and working with students one-to-one as needed. The most effective teachers:

- Have systematic procedures for supervising and encouraging students while they work
- Initiate more interactions with students during seatwork periods, rather than waiting for students to ask for help
- Have more substantive interactions with students during seatwork monitoring, stay task-oriented, and work through problems with students
- Give extra time and attention to students they believe need extra help
- Stress careful and consistent checking of assignments and require that these be turned in

MONITORING HOMEWORK

The assignment of homework, like many educational practices, can be beneficial, neutral, or detrimental depending upon the nature and context of the homework tasks. The use of homework assignments bears a significant and positive relationship to achievement when the homework is carefully monitored, as well as serving the function of increasing students' learning time. Homework confers the most beneficial results when assignments are:

- Closely tied to the subject matter currently being studied in the classroom
- Given frequently as a means of extending student practice time with new material
- Appropriate to the ability and maturity levels of students
- Clearly understood by students and parents
- Monitored by parents; i.e., when parents are aware of what needs to be done and encourage homework completion
- Quickly checked and returned to students
- Graded and commented on

The research also indicates that homework which meets these criteria is positively related to student attitudes. Students may say they don't like homework, but research shows that those who are assigned regular homework have more positive attitudes toward school, toward the particular subject areas in which homework is assigned, and toward homework itself, than students who have little or no homework.

MONITORING AS A PART OF CLASSROOM REVIEWS

Research has established a link between integrating monitoring methods into periodic classroom reviews and the later achievement of students involved in the review sessions. Daily, weekly, and monthly reviews can all enhance the learning of new material and, if they incorporate questioning and other learning probes, can call attention to areas where reteaching is needed.

The effectiveness of using review sessions to monitor student learning is clearly revealed in the research on the effects of teacher training: teachers trained in methods for conducting periodic classroom reviews which include the use of learning probes had students whose achievement was higher than it was before the teachers had been trained and higher than the achievement of students of untrained teachers. In addition, including monitorng activities in periodic reviews is a built-in feature of such successful programs as Distar and the Exemplary Center for Reading Instructon (ECRI) system, as well as being a function carried out by the effective teachers in several comparative observational studies.

CLASSROOM TESTING

Those who study assessment and evaluation techniques are quick to point out that the role of standardized testing has received considerably more research attention than have classroom testing and other classroom-level assessment methods. The existing research does indicate, however, that well-designed classroom testing programs bear a positive relationship to later student achievement. Beneficial effects are noted when tests are:

- Administered regularly and frequently
- An integral part of the instructional approach (i.e., well-aligned with the material being taught)

- Collected, scored, recorded and returned to students promptly so that they can correct errors of understanding before these become ingrained

When attitudes toward testing are studied, students who are tested frequently and given feedback are found to have positive attitudes toward tests. They are generally found to regard tests as facilitating learning and studying, and as providing effective feedback--an outcome which has surprised some researchers, who had anticipated finding more negative student attitudes toward testing.

REVIEWING STUDENT PERFORMANCE DATA

While it is beyond the scope of this paper to describe the various systems teacher can use for recording and interpreting student performance data, it is worthwhile to note the importance of having and using such a system. Research comparing effective and ineffective teachers cites the existence and use of a systematic procedure for keeping and interpreting data on student performance as a notable difference between these groups.

MONITORING METHODS USED IN COMBINATION

Research findings on the discrete effects of various classroom monitoring methods comprise only part of the story of applying classroom monitoring techniques. Research also indicates that using these methods in combination is superior to using only one or two of them. One researcher identifies five of the six monitoring methods above in his list of effective teaching behaviors. Another cites all of them as important components of a student accountability system. And in the comparative research on effective and ineffective teachers, the effective teachers were found to have implemented all or most of these monitoring functions in their classrooms.

COMMON ELEMENTS ACROSS MONITORING METHODS

Looking at the range of research on monitoring student learning, several attributes of effective monitoring are cited repeatedly across the different investigations:

- **Setting high standards**. When students' work is monitored in relation to high standards, student effort and achievement increase. Researchers caution, however, that standards must not be set so high that students perceive them as unattainable; if they do, effort and achievement decrease. The definition of "high standards" differs across studies, but generally, researchers indicate that students should be able to experience a high degree of success (on assignments, during classroom questioning, etc.) while continually being challenged with new and more complex material.

- **Holding students accountable for their work**. Establishing expectations and guidelines for students' seatwork, homework, and other functions and following through with rewards/sanctions facilitates learning and enhances achievement.

- **Frequency and regularity**. Whether the topic is teacher monitoring of seatwork, administration of tests, checking homework, or conducting reviews, researchers cite frequency and regularity in carrying out monitoring activities as a major reason they are effective.

- **Clarity**. Clarity about expectations, formats, and other aspects of direction-giving bears a positive relationship to the achievement of the students doing the homework, participating in the classroom questioning session, etc.

- **Collecting, scoring, and recording results of classwork, homework, tests, and so on**. These activities are positively related to achievement, because they produce useful information to teachers and students and because they communicate to students that teachers are serious about effort and completion of assignments.

- **Feedback**. Providing feedback to students lets them know how they are doing and helps them to correct errors of understanding and fill in gaps in knowledge. Some researchers focus on the ways in which feedback is provided, pointing out that students who are having learning dif-

ficulties require support, encouragement, and attendtion to their success if the feedback is to foster achievement of learning goals.

TEACHERS' SKILLS IN MONITORING STUDENT LEARNING

Given the strong connection between teachers' monitoring of students' learning progress and those students' academic performance, it would be ideal if teachers received thorough training in monitoring and were highly skilled in classroom monitoring practices. Unfortunately, this is not the case. The research on classroom-level monitoring and assessment reveals that:

- While standardized achievement test results are the main focus of assessment/ evaluation efforts, nearly all important decisions about student placement, instructional pacing and so on are made on the basis of teachers' ongoing classroom monitoring.

- Many teachers do not: assign homework frequently or regularly, record completion of scores on homework and classroom assignments, monitor seatwork and check on students' progress, or conduct the kind of questioning that helps to monitor learning.

- Teachers do not receive adequate preservice training in conducting formal or informal assessments.

- Administrative support for and inservice training in the skills associated with assessment and monitoring are extremely inadequate.

- Many teachers are aware that their monitoring skills are inadequate and desire training to expand their capabilities; many others are unaware of the importance of close monitoring of student progress and of their own need for skill development in this area.

The research on teachers' decision-making processes confirms this lack of monitoring on the part of many teachers. According to this research, a great many teachers are reluctant to make changes in the instructional strategy or pacing of lessons once these are planned, even when instruction and learning are progressing poorly. To a considerable degree, this improves with experience. Experienced teachers are found to vary teaching strategies in response to student performance cues much more than do novices. Still, monitoring/ assessment skills remain an area of inadequate preparation for many teachers.

Effective Monitoring Practices

Since there are so many methods of monitoring student learning, descriptions of only a few will be given here. These are offered as examples of approaches used by successful teachers.

Using learning probes is the subject of the following question-and-answer exchange with practitioners[1]:

> How do you monitor students' comprehension and work during a lesson? Teachers say they monitor students by:
>
> - asking them to interpret or summarize material presented to them in the lesson
> - thinking about the questions that students are asking and noting what parts of the lesson don't seem to be understood
> - asking questions from various levels of Bloom's taxonomy of learning objectives
> - asking students to act things out or draw them
> - walking around the class and checking worksheets, calling attention to errors and noting good work being done
> - having students do quick problems on individual chalkboards
> - encouraging children to listen to each other by summarizing comments of others and calling on children who don't seem to be listening

In the following paragraphs, a researcher reports on the differences between the moni-

[1] Excerpted from *Educational Psychology: Theory Into Practice* by Robert E. Slavin. Englewood Cliffs, NJ: Prentice-Hall, 1986.

toring behaviors of effective and less effective junior high school English and mathematics teachers[2]:

> Both effective English and math teachers were extremely consistent in efficient monitoring techniques. They did more than just circulate among students during seatwork periods. These teachers were systematic in noting individual students while moving or looking around the classroom, and they addressed individuals frequently, usually privately, to keep students accountable and on-task. These teachers were concerned that students work steadily on classwork as well as on tests, and their careful monitoring enabled them to address students immediately who were not working as expected. The nature and process of effective monitoring—of both behavior and academic work—appeared to be highly salient in both math and English classes to keeping students on-task and responsible for their work.
>
> More effective math and English teachers were extremely consistent in checking assignments regularly. Homework was assigned virtually every day, and a daily routine in most teachers' classes involved students' exchanging papers and checking them in class as directed by the teacher. Usually the more effective teachers had students sign papers they graded, and at least one effective math teacher cautioned her students to grade papers with care.
>
> Two key actions on the part of the more effective teachers in both math and English classes followed the checking period. First, these teachers asked students for their grades and recorded them immediately as the class watched and listened. Next, these teachers always took up papers to check themselves. They were thus holding students accountable for doing their work, for doing it well, and for checking it accurately. A further step noted in classes of several more effective math teachers was their individually questioning students who made low grades or zeros. These teachers determined whether students were having difficulty and needed extra help or were not doing their assignments at all. These teachers told students that they noted such grades resulting from lack of effort in their gradebook.
>
> When checking daily assignments in class, more effective math and English teachers provided feedback to students as to content as well as a review or further explanation of concepts and processes. By explaining how to figure grades and having grades announced for recording purposes, teachers enabled students to hear how they stood in relation to the rest of the class and gave evidence of the fact that the teachers took seriously the work they assigned. By taking up, checking, and returning papers, teachers provided additional feedback by means of written comments and possible modification on student grading.

The advisability of using these effective monitoring practices is further underscored in the following guidelines concerning seatwork and homework:[3]

> ...seatwork (and homework) assignments provide needed practice and application opportunities. Ideally, such assignments will be varied and interesting enough to motivate student engagement, new or challenging enough to constitute meaningful learning experiences rather than pointless busywork, and yet easy enough to allow success with reasonable effort.
>
> ...Student success rates, and the effectiveness of seatwork assignments generally, are enhanced when teachers explain the work and go over practice examples with the students before releasing them to work independently. Furthermore, once the students are released to work inde-

[2] Excerpted from *Student Accountability for Written Work in Junior High School Classes* by Murray E. Worshan. Austin, TX: Research and Development Center for Teacher Education, 1981. (ED 203 387)

[3] Excerpted from "Teacher Behavior and Student Achievement," by Jere E. Brophy and Thomas L. Good. In *Handbook of Research on Teaching* (Third Ed.), edited by Merlin C. Wittrock. New York: Macmillan Publishing Co., 1985.

pendently, the work goes more smoothly if the teacher (or an aide) circulate to monitor progress and provide help when needed. If the work has been well chosen and well explained, most of these "helping" interactions will be brief, and at any given time, most students will be progressing smoothly through the assignment rather than waiting for help.

Students should know what work they are accountable for, how to get help when they need it, and what to do when they finish. Performance should be monitored for completion and accuracy, and students should receive timely and specific feedback. when the whole class or group has the same assignment, review of the assignment can be part of the next day's lesson. Other assignments will require more individualized feedback. Where performance is poor, teachers should provide not only feedback but reteaching and follow-up assignments designed to insure that the material is mastered.

Teacher competence in assessing students' skill levels and monitoring their learning progress is essential for effective instruction to take place. "Imagine," writes researcher Robert Slavin, "an archer who shoots an arrow at a target but never finds out how close to the bull's-eye the arrows fall. The archer wouldn't be very accurate to begin with, and would certainly never improve in accuracy. Similarly, effective teaching requires that teachers be constantly aware of the effects of their instruction."

Improvements in preservice and inservice training in assessment and monitoring skills can both increase teachers' awareness of these effects and help them to make instructional changes as called for by the information they collect. This is vital for, as noted by writers Howell and McCollum-Gahley, "the most important part of continuous monitoring is not taking data, but making decisions."

Key References

Brophy, J. E. "Teacher Behavior and Its Effects." *Journal of Educational Leadership* 71(1979): 733-750.

Reviews the research on the relationship between teacher behaviors and student achievement. Teaching methods shown to promote achievement include: (1) direct instruction, (2) brisk instructional pacing, (3) frequent feedback and reinforcement, and (4) high expectations. Includes references to monitoring as an essential feature of effective teaching.

_____, and Good, T. L. "Teacher Behavior and Student Achievement." In *Handbook of Research on Teaching* (Third Ed.), edited by M. C. Wittrock. New York: Macmillan Publishing, 1985.

Summarizes research on classroom behaviors which are positively related to student achivement.

Butler, J. A. *Close-Up: Homework*. Portland, OR: Northwest Regional Educational Laboratory, 1986.

Reviews research on the effects of assigning and grading homework on student achievement. Also provides examples of district homework policies.

Edmonds, R. R. "Effective Schools for the Urban Poor." *Educational Leadership* 37(1979): 15-27.

Reviews studies conducted with inner-city children from low socioeconomic backgrounds. Characteristics of schools which are effective in educating these children include: (1) strong leadership; (2) high expectations; (3) orderly environment; (4) emphasis on basic skills; (5) using school resources to support priority goals; and (6) frequent in-class and schoolwide monitoring of student progress.

Fisher, C. W.; Berliner, D. C.; Filby, N. N.; Marliave, R.; Cahen, L. S.; and Dishaw, M. M. "Teaching Behaviors, Academic Learning Time, and Student Achievement: An Overview." *Journal of Classroom Interaction* 17(1981): 2-15.

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Investigates the relationship of teaching behaviors to academic learning time (the amount of time a student spends in an academic task that he/she can perform with high success) and to student achievement. Monitoring is identified as a function positively related to both ALT and achievement.

Fuchs, L., and Fuchs, D. "Effects of Systematic Formative Evaluation: A Meta-analysis." *Exceptional Children* 53(1986): 199-208.

Reports findings from a meta-analysis on the effects of close monitoring of the learning of mildly handicapped students. Those whose programs were systematically monitored and developed formatively achieved an average of .7 standard deviation units higher than those taught without close monitoring or programs which are developed formatively.

Good, T. L., and Grouws, D. A. "The Missouri Mathematics Effectiveness Project: An Experimental Study in Fourth-Grade Classrooms." *Journal of Educational Psychology* 71(1979): 355-362.

Reports the results of a study in which 40 teachers received instruction in effective teaching practices, then implemented these with their students. Trained teachers' students outperformed control teachers' students. Monitoring (daily review, checking daily seatwork, checking homework, weekly and monthly reviews) was a major feature of the program in which teachers received training.

Griswold, P. A.; Cotton, K. J.; and Hansen, J. B. *Effective Compensatory Education Sourcebook ,Volume I: A Review of Effective Educational Practices*. Washington, DC: U.S. Department of Education, 1986. (ED 276 787)

Reviews research on effective educational practices and gives examples of the implementation of these in Chapter 1 programs. "Closely monitored student progress" is one of 13 attributes identified as enhancing student achievement.

Howell, K. W., and McCollum-Gahley, J. "Monitoring Instruction." *Teaching Exceptional Children* 18(1986): 47-49.

Describes a research-based process for collecting data on student achievement and using it to monitor students' progress and make decisions about their instruction. Also cites research indicating that special education students whose progress is monitored in this way have higher achievement than those who are not monitored using such a process.

Hummel-Rossi, B. "Aptitudes as Predictors of Achievement Moderated by Teacher Effect." In *New Directions for Testing and Measurement: Measuring Human Abilities*. San Francisco, CA: Jossey-Bass, 1981.

Investigates the relationship between aptitude and achievement and between teacher behaviors and achievement for 219 eighth graders and 167 of these same students as tenth graders. One major findings is that student performance improves with close monitoring of learning progress.

Medley, D. M. *Teacher Competence and Teacher Effectiveness: A Review of Process-Product Research*. Washington, DC: American Assocation of Colleges for Teacher Education, 1977. (ED 143 629)

This report analyzes and synthesizes the results of nearly 300 studies. Over 600 process-product relationships are displayed in a series of tables and then synthesized into a series of statements about effective teaching. Monitoring of student understanding/learning during classroom activities was found to be an important component of effective teaching.

Natriello, G. "The Impact of Evaluation Processes on Students." *Educational Psychologist* 22(1987): 155-175.

Reviews research on the effects of different aspects of the evaluations process on student outcomes. The aspects are: (1) establishing the purposes for evaluating students; (2) assigning tasks; (3) setting performance criteria; (4) setting student

performance standards; (5) sampling information on student performance; (6) appraising student performance; (7) providing feedback on student performance; and (8) monitoring the outcome of the evaluation of students.

Peckham, P. D., and Roe, M. D. "The Effects of Frequent Testing." *Journal of Research and Developmental Education* 10(1977): 40-50.

Examines the research on the effects of frequent formative testing on student achievement and attitudes. Frequent testing has a positive effect on student attitudes. Findings are inconclusive regarding effects on achievement; however, positive achievement effects are noted when frequent testing is an integral part of the instructonal approach used (e.g., Bloom's mastery learning).

Peters, E., and Lloyd, J. "Effective Instruction: Critical Components of Teaching." *Teaching Exceptional Children* 18(1986): 46.

Reviews research-based instructional techniques that promote learning among regular and handicapped students. Identifies a "general pattern of effective instruction" which include (a) teachers monitoring instruction, (b) teachers delivering instruction, and (c) teachers managing students.

Rosenshine, B. "Teaching Funcions in Instructional Programs." *The Elementary School Journal* 83(1983): 335-351.

Cites research on effective teaching practices with a special focus on the common ingredients found in successful inservice training programs. Six vital instructional functions are described in detail: (1) review/checking previous days work; (2) presenting new content/skills; (3) initial student practice; (4) feedback and correctives; (5) student independent practice; and (6) weekly and monthly reviews.

Slavin, R. E. "The Lesson." Chapter 8 in *Educational Psychology: Theory into Practice*. Englewood Cliffs, NJ: Prentice-Hall, 1986.

Provides a discussion of the component parts of classroom lessons, including citing research in support of various monitoring activities.

Tobin, K. "Validating Teacher Performance Measures against Student Engagement and Achievement in Middle School Science." *Science Education* 70(1986): 539-547.

Tests the validity of the Teacher Performance Assessment Instruments (TPAI). Statistically significant correlations were found between various teacher behaviors and both student engagement rate and students' achievement. Several of the most strongly predictive TPAI indicators relate to monitoring and assessment.

Walberg, H. J., Paschal, R. A., and Weinstein, T. "Homework's Powerful Effect on Learning." *Educational Leadership* 42(1985): 76-79.

Reviews 15 studies on the effects of homework on achievement and concludes that: (1) regular homework confers greater achievement benefits than little or no homework, (2) the benefits are even greater if the homework is commented on and/or graded, and (3) programs in which parents are taught how to encourage their children and monitor their progress show achievement benefits.

Ward, W. D., and Jungbluth, J. E. "Sex Differences in Classroom Achievement as a Function of Participation in Monitoring and Reinforcement." *The Journal of Psychology* 106(1980): 255-258.

Compares the effects of a self-monitoring and self-reinforcement structure with those produced by an external monitoring and reinforcement structure and with the effects of one in which there was no monitoring and rewards were noncontingent. One finding was that students who experienced daily monitoring (provided by self or others) outperformed those who were not monitored.

Weber, A. *Inner-City Children Can Be Taught to Read: Four Successful Schools.* Occasional Paper No. 18. Washington, DC: Council for Basic Education, 1971.

Reports the results of an observational study in which four urban elementary schools were investigated to determine the reasons for their success in teaching reading skills. Identifies close classroom evaluation of student progress among the factors leading to success.

Wilson, R. "Direct Observation of Academic Learning Time." *Teaching Exceptional Children* (1987): 13-17.

Cites research findings on the positive effects of academic learning time (ALT) and offers a system whereby teachers or other observers can keep track of on-task behavior and student success rate.

Worsham, M. E. *Student Accountability for Written Work in Junior High School Classes.* Austin TX: Research and Development Center for Teacher Education, 1981. (ED 203 387)

Investigates the relationships between certain teaching behaviors and the achievement of junior high math students. Findings are compared with those emerging from an earlier study in junior high English classes.

_____, and Evertson, C. M. *Systems of Student Accountability for Written Work in Junior High School English Classes.* R&D Report No. 6105. Austin, TX: Research and Development Center for Teacher Education, 1980. (ED 196 008)

Investigates the relationship between accountability systems and student achievement. Seven teachers of high-achieving students were compared with seven teachers of lower-achieving students in terms of their methods of assigning and holding students responsible for written work.

Other References

Alexander, D. L.; Cotton, K. J; Griswold, M. M.; and Estes, G. D. *Effective Compensatory Education Sourcebook ,Volume III: Project Profiles.* Portland, OR: Northwest Regional Educational Laboratory, 1987.

Provides profile descriptions of the 130 programs selected for recognition in 1986 through the Secretary's Initiative to Improve Chapter 1 projects.

Beady, C. H., Jr.; Slavin, R. E.; and Fennessey, G. M. "Alternative Student Evaluation Structures and a Focused Schedule of Instruction in an Inner-City Junior High School." *Journal of Educational Psychology* 73(1981): 518-523.

Investigates the effects of a direct instruction model (focused instruction) and of two evaluation approaches on student achievement. Regardless of evalution method, the focused instruction groups performed well and outperformed controls.

Bush, M. M. "The Complexity of Institutionalizing a Program: Acquisition of Training, Observing and Computing Capability." *Journal of Classroom Interaction* 20(1984): 6-15.

Describes the ALT (academic learning time) teacher training model used by the District of Columbia Public Schools. The model includes workshops in: (1) classroom organization and management; (2) behavior management; (3) interactive instruction; (4) monitoring and feedback; and (5) improving interaction.

Chacko, T. "Student Ratings of Instruction: A Function of Grading Standards." *Educational Research Quarterly* 8(1983): 19-25.

Investigates the relationship between teachers issuing grades to students and those students' attitudes toward teachers. Graded students' evaluations of their teachers dropped after grading; those of control students did not.

Evertson, C. M.; Anderson, C. W.; Anderson, L. M.; and Brophy, J. E. "Relationships Between Classroom Behaviors and Student Outcomes in Junior High Mathematics and English Classes." *American Educational Research Journal* 17(1980): 43-60.

Reports results of an observational study involving 39 English and 29 mathematics teachers and conducted to determine teacher behavior-student outcome relationships. Of the many behaviors shown to promote student achievement, several relating to student monitoring are cited.

Griswold, P. A.; Cotton, K. J.; and Hansen, J. B. *Effective Compensatory Education Sourcebook Volume II: Project Profiles*. Portland, OR: Northwest Regional Educational Laboratory, 1986.

Provides profile descriptions of the 116 programs selected for recognition in 1985 through the Secretary's Initiative to Improve Chapter 1 Projects.

Gronlund, N. E. *Constructing Achievement Tests*. Englewood Cliffs, NJ: Prentice-Hall, 1982.

Discusses issues in planning and developing tests and provides guidelines for writing test items and designing/using essay tests.

Guerin, G. R., and Maier, A. S. *Informal Assessment in Education*. Palo Alto, CA: Mayfield Publishing Co., 1983.

Focuses on assessment strategies that can be used to organize and interpret information gathered through daily observation and interaction with students.

Linn, R. L. "Testing and Instruction: Links and Distinctions." *Journal of Educational Measurement* 20(1983): 179-189.

Discusses actual and potential relationships between testing and instruction. The purposes and uses of both classroom tests and standardized tests are outlined.

Medley, D. M. "The Effectiveness of Teachers." In P. L. Peterson and H. J. Walberg (eds.). *Research on Teaching: Concepts, Findings and Implications*. Berkeley, CA: McCutchan Publishing Company, 1979.

Discusses the history, current activities and future of research on effective teaching. Describes the processes and outcomes of conducting a large-scale review of research on effective teaching.

Purkey, S. C., and Smith, M. S. "Effective Schools: A Review." *Elementary School Journal* 83(1983): 427-452.

Provides an extensive review and critique of the literature on school effectiveness. Organization-structure variables and process characteristics of school culture are discussed. Identifies student progress monitoring as an important component of school effectiveness.

Rucker, D., and Feldman, D. *The Effects of Two Student Monitoring Procedures and Contingency Reinforcement on Three Task-Attending Behaviors*. Paper presented at the Annual International Convention of the Council for Exceptional Children, 1983. (ED 232 779)

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Shavelson, R. J. "Review of Research on Teachers' Pedagogical Judgments, Plans and Decisions." *The Elementary School Journal* 83(1983): 392-413.

Reviews research on the processes followed by teachers in determining grouping plans, instructional strategies, pacing of lessons and other classroom matters.

Stewart, L. G., and White, M. A. "Teacher Comments, Letter Grades and Student Performance: What Do We Really Know?" *Journal of Educational Psychology* 68(1976): 489-500.

Seeks to replicate a study which found written teacher comments on student papers effective in raising achievement in math and spelling. No relationship was found between the provision of comments and student achievment.

Stiggins, R. J. *Revitalizing Classroom Assessment: The Highest Instructional Priority.* Portland, OR: Northwest Regional Educational Laboratory, 1987.

Presents findings documenting teachers' need for improved classroom assessment competencies and offers suggestions for how this need might be met.

_____. "Improving Assessment Where It Means the Most: In the Classroom." *Educational Leadership* 43(1985): 69-73.

Examines the research on classroom assessment and offers recommendations for teacher training and administrator support regarding assessment.

_____; Conklin, N.; and Bridgeford, N. J. *Insights into Classroom Assessment.* Portland, OR: Northwest Regional Educational Laboratory, 1986.

Reviews research on classroom assessment and draws implications for future research and for teacher training in assessment techniques.

Walter, L. J. "A Synthesis of Research Findings on Teacher Planning and Decision Making." In *Using Research to Improve Teacher Education.* Teacher Education Monograph No. 1, edited by R. L. Egbert and M. M. Kluender. The Nebraska Consortium, 1984. (ED 246 025)

Reviews research on the approaches teachers use to plan instruction and make changes and other decisions. Cites several findings, including that teachers do not generally plan activities based on learning objectives, and that they are reluctant to make changes in lessons once these are planned even when instruction and learning are progressing poorly.

Williams, R. G.; Pollack, M. J.; and Ferguson, N. A. "Differential Effects of Two Grading Systems on Student Performance." *Journal of Educational Psychology* 67(1975): 253-258.

Investigates the relative effects of norm-referenced and criterion-referenced testing on the achievement and attitudes of students.

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School Improvement Research Series

Effective Practices in Place: Snapshot #5

Peer Tutoring: Lake Washington High School Benjamin Rush Elementary School

Kathleen Cotton

Research Findings

A review of effective schooling practices reveals that many support the use of peer tutoring. As indicated in *Effective Schooling Practices: A Research Synthesis* (Northwest Regional Educational Laboratory, 1984) supportive research findings include:

At the **classroom** level:

1.2 *There are high expectations for student learning.*

- No students are expected to fall below the level of learning needed to be successful at the next level of education.

1.3 *Students are carefully oriented to lessons.*

- The relationship of a current lesson to previous study is described. Students are reminded of key concepts or skills previously covered.

1.4 *Instruction is clear and focused.*

1.5 *Learning progress is monitored closely.*

- Teachers frequently monitor student learning, both formally and informally.
- Teachers require that students be accountable for their academic work.

1.6 *When students don't understand, they are retaught.*

1.7 *Class time is used for learning.*

- Students are encouraged to pace themselves. If they don't finish during class, they work on lessons before or after school, during lunch or at other times so they keep up with what's going on in class.

1.11 *Personal interactions between teachers and students are positive.*

At the **school** level:

2.5 *School time is used for learning.*

- Extra learning time is provided for students who need or want it; students can get extra help outside of regular school hours.

2.6 *Learning progress is monitored closely.*

- Summaries of student performances are shared with all staff who then assist in developing action alternatives. Periodic reports are also made to the community.

This list of proven instructional and administrative practices suggests some of the actions teachers and schools can take to enhance student learning and other out-

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comes. Peer tutoring, with its focus on monitoring, support, and corrective feedback, represents specific means of implementing these practices. This report details a secondary peer tutoring program and a peer tutoring program operating at the primary level.

SITUATION

Lake Washington High School (Kirkland) and Benjamin Rush Elementary School (Redmond) are in the Lake Washington School District, located across Lake Washington from Seattle. Over 20,000 students attend Lake Washington's 31 schools. The area is predominantly suburban and relatively affluent ($27,500 median annual family income in 1984), although 15 percent of the population lives in households with less than $15,000 annual income. Over 90 percent of Lake Washington's students are Caucasian. The largest minority group is the 5.4 percent of the district's students who are of Asian extraction.

Lake Washington High School has 1,582 students in grades 10-12. Benjamin Rush is a K-6 school with 586 students.

In 1982, the Lake Washington School District made available $2 million for remediation programs, and schools within the district were invited to plan and develop their own remediation approaches. At Lake Washington High School and at Benjamin Rush Elementary School, an educational consultant to the district worked with school staffs to set up peer tutoring programs to help those students who were performing below grade level.

Context: Lake Washington High School

Observations of a peer tutoring program in operation in the Beaverton (Oregon) School District led Lake Washington High School staff to decide to develop and implement a similar program. However, whereas the Beaverton program included the use of instructional aides, the Lake Washington program was set up to be entirely reliant on students to conduct the tutoring.

Now in its sixth year of operation, the peer tutoring program is a well-established part of the life of the school. Depending upon the semester, the class meets for either five or six 55-minute periods per day, with 125 to 150 students participating. A part-time program manager and three part-time teachers staff the peer tutoring program. Major program features are as follows:

- **Elective credit.** Peer tutoring is an elective class for which both tutors and tutees receive credit towards graduation.

- **Staffing by subject matter teachers.** Based on the failure of some peer tutoring programs operated by special education teachers in special education resource rooms, Lake Washington program developers were careful not to put students off by using such a structure. Instead, the program has its own room and is staffed by social studies and English teachers, as well as special education teachers.

- **Student selection based on interest and willingness.** Potential tutors may be recommended by teachers or counselors; and potential tutees may be encouraged by counselors, teachers, or parents. Ultimately, however, self-selection is the major avenue by which students become involved. Program teachers have found that dedication and perserverance are the most important qualities in both tutors and tutees, and that these attitudes are not likely to be present if a student is in the class against his or her will.

- **Focus on target classes.** When signing up for peer tutoring, each tutee identifies a "target class" — one course in which he/she anticipates needing help — and this becomes the focus for the tutoring during the semester. Tutors identify target classes, too, and may receive help from the teacher and/or other students. The "target class" choice of the tutors serves primarily as a model for their tutees. They share with tutees their notebook organization, time management calendars, notes, assignment records, etc.

- **Tutor-tutee pairs.** Tutors and tutees are arranged in pairs or trios based on target class needs and ability to work together.

These partnerships are maintained throughout the semester.

- **Training.** At the beginnning of each semester tutors and tutees receive training in study skills, learning strategies, organizational skills, mnemonic devices, time management and other methods for learning how to learn effectively. Students also learn communication skills and ways to give each other encouragement and positive feedback. A cooperative learning approach is used for the training, with "veteran" and new members of the peer tutoring class working together.

- **Mini-lessons.** The first five to ten minutes of each peer tutoring class are devoted to reviewing learning strategies, tutoring methods, and other processes introduced in the initial training.

- **Testing program.** Students are periodically tested on learning strategies, study skills, and other content presented in the initial training and ongoing mini-lessons.

- **Master note takers.** Each regular class teacher designates a capable student to be "master note taker" for that subject on that day. The notes this student takes are made available in the peer tutoring room as a resource for students. A copy is also given to the "target class" teacher, who may use them for absentees, developing tests, and/or to check due dates.

- **Recordkeeping.** Records of student progress are kept through the use of forms such as Daily Learning Goals (which inludes a Learning Log), a Peer Tutoring Checklist, a Peer Tutoring Progress Report and bimonthly discussion sessions among tutors and teachers regarding the progress of tutees.

- **Planning/coordination activities.** Meetings of peer tutoring staff members are held weekly. Communications with classroom teachers are frequent and include class notes, progress reports, and informal verbal communication.

In discussing the evolution and present structure of the program, the program manager pointed out several additional features. She noted that intelligence *per se* is not sufficient to be a successful tutor. In addition to the willingness and dedication mentioned above, successful tutoring also requires patience, enough assertiveness to keep students on task and social skills to engage and motivate tutees. Some of the best tutors are students who have been tutored in the program themselves; these students can relate to the difficulties their tutees encounter, and they know from experience that the tutoring process can help them to succeed. In contrast, high achievers are sometimes impatient and unsupportive in their dealings with tutees.

Washington requires that students fulfill a requirement to earn **occupational credits** — credits for job/career-related activities. The program manager reported that an effort is currently under way to get occupational credit status for the peer tutoring program based on the content and processes students learn — content and processes which relate directly to careers in teaching, counseling, and many other social services. Citing the emphasis on teaching, testing, and skill building, the program manager emphasized that peer tutoring is not merely a "glorified study hall."

Evaluations of the program indicate that the **academic achievement** of participating students has improved as a result of their involvement. Teachers and students are also enthused about the **affective benefits** of the program — improvements in student attitudes and self-esteem, as well as breaking down social barriers and forming new friendships.

The manager noted two additional **unanticipated outcomes** of the program: One is that some participants have acquired paid, out-of-school tutoring jobs; families wanting to hire tutors frequently call the program manager for recommendations. Another is that the program has become a force in drug/alcohol interventions and suicide prevention. The close ties which often develop between tutors and tutees have resulted in students confiding in one another about these personal problems and being guided to sources of help.

Adult volunteers sometimes work with program students, too. However, since there is a strong emphasis on keeping the program a *peer* tutoring effort, these adults generally have roles other than providing tutoring.

They may check students' notebooks, review their progress, and make suggestions to improve the effectiveness of the tutoring.

Some students are both tutors and tutees, providing help in one subject area and receiving help in their own target subjects. Students have coined the term **teeters** to describe this double participation. Teeters claim that what they learn as tutors is helpful to them in their roles as tutees, and vice versa.

Handicapped students who appear likely to benefit from peer tutoring have begun participating in the program this year. When a boy with Down's Syndrome joined one of the peer tutoring classes, a special education teacher prepared the class by giving a presentation about Down's Syndrome, followed by a class discussion of the condition.

Benefits to the teachers in the peer tutoring classes are numerous. Familiarity with the coursework and assignments in a wide array of classes keeps them aware of what is occurring schoolwide. Moreover, the need to be able to provide at least basic assistance with this wide range of courses leads the peer tutoring teacher to become something of a "Renaissance person." Teachers also perform various counseling functions, thus increasing their skills and receiving personal gratification from helping students with their school-related and personal issues. Perhaps most rewarding of all, according to the program manager, are the responses students give when asked to identify, at the end of each semester, "something I learned from taking this class." Quite often, students have success stories to tell regarding improvements in a particular class, and sometimes students indicate that participation in peer tutoring brought them their first real experience of academic or social success.

Asked about any problems encountered in operating a peer tutoring class, the manager identified two issues. One of these is the push for increased graduation requirements. As graduation requirements increase, time is reduced for participation in peer tutoring, and, in the manager's view, the increased requirements result in needful students simply being given more classes to fail. The other issue is the toll taken on teachers in the peer tutoring class. Recruiting students for the class and teaching and monitoring it are very interesting and rewarding activities, but they are also very demanding and exhausting.

For more information about the Lake Washington program, contact Kathy King, Peer Tutoring Program Manager, Lake Washington High School, 12033 N.E. 80th, Kirkland, Washington 98033, (206) 828-3371.

Practice: Secondary Peer Tutoring

The description which follows is based on observation of and interaction with students in three peer tutoring classes, as well as interactions with the program manager.

Students entered the peer tutoring room and sat down, two or four to a table. Warm greetings and good-natured teasing between the teacher and the students took place at the beginning of each class period.

The teacher began each class by displaying an overhead transparency of the Monthly Time Management Calendar used by the students. She called students' attention to current requirements and deadlines, including a reminder that midterm reports were about to be given regarding students' progress in their classes. She reviewed the kinds of classroom behaviors that could improve their reports, asking students to identify some appropriate behaviors. Maintaining eye contact, not talking out of turn, and asking questions were among the behaviors mentioned.

The teacher then called students' attention to an event affecting many of them, an upcoming American Government test. She displayed a transparency of a Daily Goals sheet, and indicated how it might be filled out to guide students in preparing for the test.

Students then began working, mostly in pairs, although there were some students whose tutors or tutees were not present. In the first period class, there was also a group of four students who were working together on preparing an oral report on AIDS and drugs. In all of the classes, the teacher moved around the room, answering questions, stopping to help students as needed, and getting students

back on task. Periodically, the teacher found it necessary to tell students to be more quiet. Part of the noise level was created by off-task behavior, but most seemed to emanate from the interactive nature of tutoring.

At the end of each class, the teacher reminded students to complete the Learning Log portion of their Daily Goals sheet, which asks for a brief description of "What I Learned Today." During the break between the first and second class observed, several students remained in the tutoring room engaged in a spiritied discussion about the law of supply and demand as applied to drugs and alcohol.

Students were individually asked (1) how peer tutoring had benefitted them, and (2) what advice they would give to other high schools about setting up a peer tutoring program. Responding to the first question, students commented:

- "It helps you build relationships with others. You get to know people you might not get to know without this class." (Girl "teeter," second-year participant)
- "You get to see someone else learn and take pride in helping others." (Girl tutor, second-year participant)
- "You get help finishing your assignments and you make new friends." (Boy tutee, second-year participant)
- "You worry out loud. My grades are better and I like it. It's not like a class." (Boy tutee, first-year participant)
- "It helps me study and learn more independently." (Boy tutee, first-year participant)
- "It makes you work hard." (Girl tutee, first-year participant)
- "I'm L.D. [learning disabled] and my parents wanted me to take it [peer tutoring class]. I like it. I get my work done." (Boy tutee, second-year participant)
- "It helps to get homework done and study for tests. It's boring, but it helps." (Girl tutee, second-year participant)
- "It fills a gap. Teachers don't always have time to help you at the end of class. It helps you make good use of time and get things done." (Boy "teeter," third-year participant)
- "My study skills and organizational skills are better." (Girl tutor, second-year participant)

Asked what advice they would give to others considering setting up a peer tutoring program, students responded:

- "You need an understanding teacher who is flexible, because you have to be able to talk in this class." (Boy "teeter," second-year participant)
- "You need lots of spaces. There are kids here who want in this class, but there isn't any more room." (Girl tutor, second-year participant)
- "This class is too big and noisy. It should be smaller." (Girl "teeter," first-year participant)
- "Be sure and teach study skills and learning strategies, stuff like that." (Boy tutee, second-year participant)
- "You should have a teacher who can get you to work without being too pushy. The teacher should know the other teachers and what they expect. This class is good for that." (Boy tutor, second-year participant)
- "Set it up so tutors quiz you before tests." (Boy tutee, first-year participant)
- "It's good to work with people who have the same target class." (Boy "teeter," third-year participant)
- "A big class is good, but the noise is hard for some people." (Girl "teeter," second-year participant)
- "The teacher needs to understand individual needs." (Girl tutor, second-year participant)

In a spin-off from these question-and-answer periods, members of one peer tutoring class

began talking to one another about the benefits of the class and how a peer tutoring class should be set up. This included students who have been helped by the class encouraging their task-resistant peers to get involved.

Context: Benjamin Rush Elementary School

Three years ago, a consultant to the district worked with staff at Benjamin Rush Elementary School to develop a tutoring program and manual, which were subsequently adapted and implemented in the school. In its first year of operation, the program made use of fifth and sixth grade tutors, who worked with tutees in grades one, two, and three in reading and mathematics. Program evaluation data indicated that the program was successful; however, classroom teachers disliked the fact that tutors were missing regular class activities to work with their tutees. They called for a change in structure.

During the second year, the school implemented the "Help One Student to Succeed" (HOSTS) program, which relies upon parents and especially community members to tutor children who are in need of extra time and help to develop skills. The student-to-student tutoring component was greatly reduced, with fifth and sixth grade students working with students in grades one through three during part of the tutor's lunch/recess period. A highly-structured reading skill development program, which dovetailed with the basal reading series, was used. While useful, this program did not have built-in motivational components, and it was necessary for the teacher to continually develop motivation-building activities for tutors to use with their tutees.

This year the school continues to use the HOSTS program, with students in grades two to six participating. In addition, a cross-age tutoring structure is used with fifth and sixth graders working with first graders in reading. Major features of the cross-age tutoring program include:

- **Reading room.** This program makes use of a reading room with two-person work tables and in which the reading specialist is available to provide help.

- **Tutor selection.** The reading specialist makes presentations in the fifth and sixth grade classes; interested students write a letter on the topic, "Why I Would Be a Good Tutor." The reading specialist and classroom teachers make selections.

- **Tutee selection.** Children in need of remediation are recommended by their classroom teachers.

- **Partners in Reading.** This is a new and more motivational program than the one used in previous years. The program operates on a two-day cycle: on Day One, tutees read a story with help from their tutors, and on Day Two they review the story and conduct a series of activities related to it. Pictures, cut-outs, flashcards and other materials are used for these activities.

- **Use of the tutor's lunch/recess period.** Tutoring takes place twice a week, for 25 minutes at a time, during the tutor's lunch/recess period. First grade tutees leave their classrooms to come to the reading room, and their teachers conduct non-core activities during their absence.

- **Training.** Tutors receive an initial seven days of training, during which they learn the reading program structure, how to conduct activities with students, and methods for praising and encouraging students.

- **Recordkeeping.** In addition to daily records of activity completion and performance, tutors also complete quarterly "report cards" on their tutees. The reading specialist also prepares reports on the performance of tutors. Both kinds of reports are sent to students' classroom teachers.

- **Monthly meetings.** Tutors meet once a month with the reading specialist to discuss the progress of their tutees, complete appropriate forms, and bring up any problems they might be experiencing.

At the present time the program is small, with

12 first graders and 12 tutors participating. The goal for this year is to expand to 18 tutor-tutee pairs. The reading specialist noted that the next step in this continually evolving program may be to increase participants' involvement from two to three days per week, with the third day devoted to activities beyond the "Partners in Reading" materials now in use. The program may also expand once again to include second and third grade tutees.

Other significant program attributes include:

- Tutoring support is provided by local secondary parochial school students, who help out in fulfillment of their schools' community service requirement. These students tutor children in grades one through five.

- Considerable emphasis is placed, during training sessions and thereafter, on giving encouragement and positive feedback in order to build children's confidence and self-esteem. As noted at the secondary level, the best elementary tutors are often students who have experienced learning difficulties themselves.

- The reading specialist emphasized the necessity of working intensively with tutors and "overtraining" them, since a great deal of training is needed for them to function effectively.

When asked what advice she would give to others considering setting up a similar program, the reading specialist recommended that schools start small and expand the program slowly, and that they work to create an environment in which tutors can feel free to ask questions and voice their concerns. She also noted that scheduling the tutoring during the older students' recess period appears to have discouraged the participation of boys as tutors. Whereas several boys participated when the tutoring took place during class time, only two currently participate. The reading specialist speculated that boys are more reluctant than girls to give up their recess period.

More information about the Benjamin Rush Program is available from Sue Parker, Benjamin Rush Elementary School, 6101 152nd N.E., Redmond, Washington 98052, (206) 881-6047.

Example: Elementary Tutoring Program

During the small tutoring session (four tutors and four tutees), the tutors helped the first graders to sound out words with which they were having trouble as they read a story. The tutor covered parts of each difficult word and helped the tutee to read syllable by syllable. The tutor then asked the tutee to read the entire word, checking comprehension. Tutors also conducted comprehension checks of phrases, sentences and larger units of the story.

The tutors frequently praised their tutees during these interactions. The overall tone of the tutoring class appeared relaxed and positive, with students frequently smiling as they worked. The reading specialist was available to provide help during the session.

Tutors explained the system they used for conducting daily activities and keeping track of their tutees' progress. Their comments included that they enjoy helping people and seeing them learn better. Tutees were asked whether they like the tutoring class and, if so, what they like about it. Responses included:

- "I like it. She helps me."

- "I like to have someone to read with."

- "It's fun."

Tutors accompanied their tutees back to their classes at the end of the tutoring session.

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School Improvement Research Series

Effective Practices in Place: Snapshot #6

Clear, Consistent Discipline: Centennial High School

Jocelyn A. Butler

Research Findings

Clear, firm discipline and attendance policies that are consistently enforced contribute to high student performance, according to the findings from the effective schools research. As identified in *Effective Schooling Practices: A Research Synthesis* (Northwest Regional Educational Laboratory, 1984), those research findings include:

At the **classroom** level:

1.8 *There are smooth, efficient classroom routines.*

- Administrative matters are handled with quick, efficient routines that keep class disruptions to a minimum.

1.10 *Standards for classroom behavior are explicit.*

- Teachers let students know that there are high standards for behavior in the classroom.
- Rules, discipline procedures and consequences are planned in advance. Standards are consistent with or identical to the building code of conduct.
- Consistent, equitable discipline is applied for all students. Procedures are carried out quickly and are clearly linked to students' inappropriate behavior.

At the **school** level:

2.7 *Discipline is firm and consistent.*

- A written code of conduct specifies acceptable student behavior, discipline procedures and consequences; students, parents and staff know the code; students and staff receive initial training and periodic reviews of key features.
- Discipline procedures are routine and quick to administer. Disciplinary action quickly follows infractions and is always consistent with the code; treatment is equitable for all students. Follow-up and action for absenteeism and tardiness normally occur within a day.
- Out-of-school suspensions or expulsions are minimal; in-school suspension is used in most cases.

Situation

Centennial High School is located in a suburb of Portland, Oregon, and serves approximately 1500 students in grades 9-12. There are few minority students at the school, and student turnover is between 20 and 30 percent each year.

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School Improvement Program

Sponsored by OERI Office of Educational Research and Improvement U.S. Department of Education

Since 1983, the school has focused on long-term, data-based improvement using the "Onward to Excellence" model developed by the Northwest Regional Educational Laboratory. Following a 10-step process, the school has used student performance data in a collegial effort to set and meet schoolwide improvement goals.

Context

During the first year of Onward to Excellence in the school, Centennial set two major schoolwide improvement goals, one focusing on improving student academic performance and the other on attendance. The goal set in 1983 was to reduce student absences and tardies by 50 percent by June of 1985. At that time, 10 percent of the students were absent daily. In a school with Centennial High's characteristics, five percent absenteeism would be expected.

Attendance and discipline had been ongoing concerns in the school for over 14 years, with little agreement among staff about how best to handle these areas. The establishment of the priority schoolwide goal enabled the school staff to focus on and work together toward resolving this problem area.

A revised student code of conduct, clear discipline procedures and a more concise attendance policy were developed. During the second semester of the 1984-85 school year, about 20 teachers piloted the new approach; and in the fall of 1985 the code, procedures and policy were implemented schoolwide.

Since the institution of the new discipline/attendance program at the school, absenteeism has dropped to eight percent, and there is a larger incidence of excused absences than of unexcused absences. In addition, student scores on the annual standardized achievement tests have increased, which may be tied to the changes in handling of attendance and discipline. For further information about the program, contact Dick Lund, Assistant Principal, Centennial High School, 3505 S.E. 182nd Ave., Gresham, OR 97030 (503/661-7612).

Practice: Clear, Consistent Discipline

There is an explicit, clear and consistent discipline system at Centennial High School. Expectations for student behavior and repercussions for not meeting those expectations are clearly described in the booklet, "Rules for Student Behavior." Copies of the booklet are given to all parents of incoming students, and new students are familiarized with requirements as part of their orientation to the school.

Major expectations of students are that they understand and follow school rules, attend school regularly and on time and respect the rights, property and safety of others. Students who become involved in areas of problem behavior are subjected to specified disciplinary actions based on the seriousness of the behavior problem. All students are subject to the same disciplinary actions according to descriptions included in the booklet.

Disciplinary actions taken by school administrators are in increasing levels of seriousness:

- **Warning.** At this stage, a school administrator discusses with the student the student's behavior and tries to reach agreement regarding how the student should behave.
- **Conference.** A formal conference takes place between the student and one or more administrators during which the student must agree to change behavior. A written record is kept.
- **Parent Involvement.** A parent is notified by telephone, personal contact or letter. There may be a conference involving the student, a parent, school officials and others involved, again with a written record.
- **In-school Suspension.** A misbehaving student is reassigned to a separate supervised environment within the school and may be referred for counseling, may undergo a schedule change or may have a work assignment around the school. Written records are maintained.

- **Out-of-school Suspension.** Discussion *takes place with the student of impending* suspension to provide a hearing of the student's side of the situation; the student is excluded from school and school-related actitivies for a specified period of time (one to seven days) with possible advisement of district or community alternatives. Written records are kept.

- **Expulsion.** The student is informed of immediate suspension and recommendation for expulsion, the removal of the student from school and all related school activities. The Board of Directors determines the length of time a student is expelled. Student and parents are informed of the impending expulsion and informed of the student's rights under due process. Again, alternatives are described and written records kept.

All of these levels of action are clearly described in the booklet, "Rules for Student Behavior." In addition, these levels of disciplinary action are clearly tied to individual areas of problem behaviors with specific consequences listed for first and repeated occurrences of the infractions.

There are 21 problem areas defined and tied to consequences in the booklet. They include tardiness, closed campus violation, defiance of authority, disorderly or disruptive conduct, automobile misuse, bus misconduct, forgery or lying, loitering, theft, tobacco, mischief, vandalism, alcohol or drugs, recklessly endangering, menacing or harassment, assault, fighting, weapons, extortion, explosive devices and arson. Levels of disciplinary action are carefully matched to the infractions and are explicitly described.

"Loitering," for example, is defined as the student's being in a restricted area of the building or campus without permission. The minimum action to be taken for the first occurrence is **Warning**; the minimum action to be taken for a repeated occurrence (second or subsequent infraction) is a **Conference**. The maximum action to be taken for loitering is **Suspension**.

In another instance, "Bus Misconduct" is defined as the student's acting in a manner which may distract the driver or result in unsafe conditions. The minimum action for *first occurrence* is **Warning** and for repeated occurrence is **Parent Involvement**. Maximum action for first occurrence is **Suspension** and for repeated occurrence is **Expulsion**.

In all cases, a degree of discretion is exercised by the administrator taking action in the problem areas, thus the assignment of a range of minimum and maximum actions for each problem area. If, for example, a student has demonstrated excellent behavior and then becomes involved in an infraction, school administrators may consider the previous record in determining the action to be taken. If negative behavior is directly related to an identified handicap, that is considered; and if a student has continually been involved in problem areas, disciplinary action taken will probably be the maximum action listed. Severe violation of rules may result in disciplinary action that extends beyond the guidelines listed in the booklet.

Records of all discipline actions are kept based on a "Disciplinary Referral" form completed for every student referral (Figure 1). The first portion of the form, filled in by the referring teacher, identifies the student; the behavior area; referring teacher; date, time and class in which infraction took place; and date(s) of parent and counselor contact. Teachers fill in these data, then mark the reason for referral by selecting one from the list of behavior areas (the same as those in the students' booklet) preprinted on the form. They also describe the problems necessitating the discipline referral. Both the student and the referring teacher then sign this portion, and the form is transmitted to the school office for action by one of the two assistant principals.

The second half of the form is then completed by the assistant principal and describes the action taken, again reflecting those possible actions listed in the students' booklet. Both administrator and student sign this portion of the form.

This "Disciplinary Referral" is printed on four-part, no-carbon paper. When both portions of the form have been completed, copies are distributed to the administrator assigning disciplinary action, to the student's parent as necessary, to the student's counselor and to

Figure 1

CENTENNIAL HIGH SCHOOL -- DISCIPLINARY REFERRAL

ID#_____
Student_____ Grade: 9 10 11 12 Date ___/___/___
Referred By _____ Period _____ Class _____
Date(s) of Parental Contact _____ Date(s) of Counselor Contact _____

REASON FOR REFERRAL: (Circle Number)

1	Tardiness	6	Forgery or Lying	12	Alcohol or Drugs	16	Fighting
2	Closed Campus Violation	7	Loitering	13	Recklessly Endangering	17	Weapons
3	Defiance of Authority	8	Theft			18	Extortion
4	Disorderly/Disruptive Conduct	9	Tobacco	14	Menacing or Harassment	19	Arson
		10	Mischief			20	Assault
5	Bus Misconduct	11	Vandalism	15	Auto Misuse	99	Other

EXPLANATION (Cite specific problems and give appropriate dates). Location _____

Teacher's Signature _____ Student's Signature _____

ACTION TAKEN: Date ____/____/____ Reinstatement Date: ____/____/____

1	Warning	4	Parents contacted by phone	7	In-school suspension
2	Conference with student	5	Conference with parent	8	Out-of-school suspension
3	Referral/letter sent home	6	Parent conference requested	9	Expoulsion
				99	Other

COMMENTS:

Administrator's Signature _____ Student's Signature _____

the referring teacher. In this way, all concerned are kept apprised of the disciplinary action taken.

Designed through teamwork by teachers and administrators, this form is the backbone of a recordkeeping system supporting the relationship between the behavior problem area and disciplinary action. Through this brief, easily understood one-page form, teachers, students, parents, counselors and administrators are all informed of action and how it is tied to the student code of conduct.

All student referrals are entered into a computerized schoolwide data system at regular intervals by office staff at the school. Entries are coded into the system according to student identification numbers. These data can then be extracted in a number of ways: by individual student, by infraction, by grade level, by location (classroom, lunchroom, etc.), by time

period, etc. The information is available only to administrators, although teachers may ask for general information about students, and counselors keep separate records based on their own copies of referrals.

Approximately once per month or at other appropriate intervals (e.g., end of term), the assistant principals receive printouts of current data on discipline violations, usually listing individual students. This is the most useful form of data for them, as it helps in monitoring individual students' behaviors and in alerting administrators to the need for progressive discipline actions.

Examination of these data has been useful in identifying ways to adjust procedures in the school to reduce discipline infractions. Student tardies, for example, comprise over 50 percent of all infractions in the school. When the data were examined, it became evident that a large number of tardies were taking place in the first period of the day and in the first period after lunch. Changes in staff supervision patterns so that teachers are in the parking lot before school and walking through the halls just after lunch have reduced tardies in those time periods.

In still another use of the data, discipline information is reviewed annually during the school's goal-setting process. In the 1987-88 school year, the school's goal is, in fact, to reduce discipline infractions by 30 percent schoolwide.

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School Improvement Research Series

Effective Practices in Place: Snapshot #7

Cooperative Learning: Central Elementary School

Jocelyn A. Butler

Research Findings

Research supports the use of cooperative learning approaches in the classroom. As identified in *Effective Schooling Practices: A Research Synthesis* (Northwest Regional Educational Laboratory, 1984), those findings include:

At the **classroom** level:

1.1 Instruction is guided by a preplanned curriculum.

- Resources and teaching activities are reviewed for content and appropriateness and are modified according to experience to increase their effectiveness in helping students learn.

1.2 There are high expectations for student learning.

1.3 Students are carefully oriented to lessons.

- Teachers help students get ready to learn. They explain lesson objectives in simple, everyday language and refer to them throughout lessons to maintain focus.

1.4 Instruction is clear and focused.

- Students have plenty of opportunity for guided and independent practice with new concepts and skills.
- Teachers select problems and other academic tasks that are well matched to lesson content so student success rate is high. Seatwork assignments also provide variety and challenge.

1.5 Learning progress is monitored closely.

- Teachers require that students be accountable for their academic work.

1.6 Instructional groups formed in the classroom fit instructional needs.

- When introducing new concepts and skills, whole-group instruction, actively led by the teacher, is preferable.
- Smaller groups are formed within the classroom as needed to make sure all students learn thoroughly. Students are placed according to individual achievement levels; underplacement is avoided.
- Teachers review and adjust groups often, moving students when achievement levels change.

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School Improvement Program

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Situation

Central Elementary School was created in 1985 as a special demonstration school in a cooperative project between the Snohomish, Washington School District and Western Washington State University. The impetus for the project was the district Board of Education's decision to focus on improving student learning in the area of higher-order thinking. Since it opened, a cooperative learning approach has been applied throughout the school, the result of a Board resolution identifying cooperative learning as a main district priority.

There are 6,000 students in the Snohomish public schools, which include seven elementary schools, two junior high schools, and one high school. Five of the seven elementaries are Chapter 1 schools. Historically an agricultural community, the district is in transition as increased numbers of professionals working in nearby Seattle move into the area.

While smaller than other elementary schools in the district, the Central population of 284 students, grades K-6, is typical. There are fewer than one percent minority students, and Central is a Chapter 1 school with 23 percent of students involved in the free and reduced lunch program.

Context

For approximately 11 years, Snohomish School District teachers have been involved in staff development focused on Madeline Hunter's approach to improving instruction. The staff members who comprise the Central faculty have, in addition, all undergone extensive training in the Johnsons' cooperative learning approach.

In the Johnsons' model, there are 18 elements of structuring cooperative learning situations effectively:

1. Specifying instructional objectives
2. Deciding on the size of the group
3. Assigning students to groups
4. Arranging the room
5. Planning the instructional materials to promote interdependence
6. Assigning roles to ensure interdependence
7. Explaining the academic task
8. Structuring positive goal interdependence
9. Structuring individual accountability
10. Structuring intergroup cooperation
11. Explaining criteria for success
12. Specifying desired behaviors
13. Monitoring students' behavior
14. Providing task assistance
15. Intervening to teach collabortive skills
16. Providing closure to the lesson
17. Evaluating the quantity and quality of students' learning
18. Assessing how well the group functioned

(See David W. Johnson, et al., *Circles Of Learning*. Alexandria, VA: Association for Supervision and Curriculum Development, 1984.)

All Central staff have been trained in the model, and the school is in its second year of implementing cooperative learning schoolwide. Implementation has been supported by the district, and the school has served as a model to the rest of the district with one day per month set aside for visitation and observation by teachers from other schools. Central staff members meet weekly in 45-minute staff meetings with timed agendas to discuss progress and solve problems. In addition, the staff gathers for a four-hour work session once a month to study research and identify problem areas in the school.

Staff members are organized into groups to facilitate implementation. The principal randomly gives teachers year-long assignments to four-member "base groups" for support, celebration and problem solving. In "work groups," on the other hand, pairs of teachers share preparation periods to plan instruction, individually teach lessons, debrief their experiences, co-teach occasionally, and eventually observe one another. Short-term informal groups are also formed for special projects or specific activities. For further information on the Central approach, contact Nancy Whitson, Principal, Central Elementary School, 221 Union Avenue, Snohomish, Washington 98290 (206/568-0682).

Example:
Music Lesson, Grade Six

All students in the school report to a portable classroom for a one-half hour music class twice a week. This cooperative lesson involves 24 sixth grade students. As students enter the classroom, they pick up sheets of printed song lyrics, go to preassigned seats, and begin to sing along as the teacher plays the piano.

After the class settles in and completes the singing part of the class, the teacher announces the main activity for the day: Students in pairs will work together to learn to play a new song on xylophone-like instruments. Instruments are already in place in a semicircle on one side of the room.

First, students will work together to name the notes of the new song and write the names down on a worksheet. Then each will be assigned one portion of the notes on the scale, and each will be responsible for playing those notes in rhythm as the pair learns to play the song.

The teacher reviews the names of the notes on the blackboard in preparation for the students' work, and students number off into pairs and are assigned to instruments. They quickly move to their positions, and each pair chooses a recorder. The recorder goes to the front of the room to pick up the worksheet, one per pair.

Students fill out the worksheets together and both sign their names. The teacher goes around the room and checks the work for all pairs to be sure they have named the notes correctly. Pairs decide which notes each will play and begin to work out the song ("Twinkle, Twinkle Little Star"). After 10 minutes, the teacher selects one pair to demonstrate the song, then leads all pairs together through the song.

Once the exercise is completed, the teacher debriefs the exercise, noting ways in which students excelled at working together. Each pair of students then shares with their partners one thing they did that helped their partner and one that both could work on to improve. The full group then shares suggestions about what to do better next time.

Example:
Grades One and Two

A three-teacher team is responsible for a mixed group of 34 first graders and 48 second graders. They share a large room (two converted classrooms) which has four main areas: three teaching stations with seats at tables for individual students where much instruction takes place, and an open, carpeted area for special activities. This lesson is a full-group cooperative learning exercise to practice using pictographs in sentences.

As the sequence begins, all 82 students are at their assigned home desks in one of the three teaching areas, heads resting on arms on desks. As groups are called, the children move quietly and in an orderly manner to "the rug" and seat themselves facing front. Transition to this area takes about four minutes.

In the following half hour in this arrangement, the students work with the teacher leading this lesson while the two other teachers observe. Lesson content includes:

- Review of a previous communications lesson in which the concept of pictographs (pictures representing words or concepts, e.g., "man," "woman," "peace," etc.) was introduced.
- Review of a previous history lesson about the Mayflower Pilgrims and their sharing Thanksgiving with the American Indians
- Introduction of 18 new pictographs with explanations and the teacher's writing of their names beneath them.
- The reading through of demonstration sentences prepared earlier by the teacher to show how pictographs and words can be used together to make sentences.

Throughout this lesson, students are involved through a variety of questioning techniques to assure all understand the pictographs.

The teacher leading the lesson then describes the cooperative learning assignment: Students will work with preassigned partners to make up three sentences using at least one pictograph in each sentence. Copies of the 18 pictographs and paper to use in the assign-

ment have been prepared. Pairs of students who finish early are to use any remaining time to draw a picture of the Mayflower on the back of their lesson worksheet.

Students are reminded that this activity will require two cooperative skills which they already have. They are reminded that they will use "twelve-inch voices" as they work together, speaking softly so they can only be heard a foot away. They also are reminded to make an effort to use "nonverbal put-ups," (praise or encouragement that is the opposite of a "put-down": a smile, applause, a pat on the back). The teacher says she will be circulating to watch for these behaviors, and the goal is for the names of everyone in the class to be placed on her list of those who are using these cooperative skills.

The students quickly and quietly return to their home areas. The teacher then asks that students take a moment to remember who their partners are and lists of partners are, posted in each of the three teaching areas. Students who are on the left side of the list of pairings are told to bring a pencil, crayons and eraser to the assigned spot in the room; those on the right side of the page will retrieve the worksheet for their pairs from the teacher in the center of the room. The students are then released to find their partners and their space, bringing their required equipment. In the time it takes the teacher to count backward slowly from eight to one, all 82 students are paired, in place and at work on the task—some at desks, some on "the rug," some on the floor. As they complete the assignment, all three teachers circulate and have individuals read aloud the sentences they have been writing with their partners.

After the allotted 15 minutes for the practice, students are given directions to put both their names on the shared paper and to list the number of nonverbal put-ups on the sheet. They have one minute to finish these tasks.

They then are asked to take the papers and return to their regular assigned seats. The teacher then asks individual students to come to the front of the class and read their sentences. Papers are collected and later bound into a book so that all students' work is displayed to the full class.

Example: Problem Solving

A class of 29 advanced placement students from grades four, five and six are frequently involved in collaborative learning. This lesson is designed to increase their questioning and problem-solving skills.

The teacher announces the lesson as a review of math problems in the context of improving collaborative skills. Objectives are identified as increasing general problem-solving skills and students' involvement in thinking about thinking: In groups of three, students will take on roles either of analyzer/monitor (keeps the group on task and moves it toward reaching solutions to problems), recorder (writes down processes as group members solve the math problems together) or the questioner (formulates questions to guide the group toward task completion).

There is discussion about the types of questions and strategies necessary for the lesson. The teacher emphasizes that questions are for clarification or elaboration of the task. Student examples of questions include: "What do you mean by that?" "Can you tell me more?" "Would you please go a little farther with this?" The questions are to help the group understand the task and get the other people in the group to think in different ways about what must be done. While the groups are working, two student monitors will be circulating to record examples of good questioning techniques and thinking strategies.

The teacher announces the preassigned groups, and students move quickly into preassigned spaces around the room, sitting "knee to knee and eye to eye." Groups have been arranged so that there is a specific mix of students in each. The teacher then gives all nine groups role assignments: oldest student (sixth grader) is the analyzer/monitor; the youngest (fourth grader) is the recorder; the middle student (fifth grader) is the questioner. Two observing monitors are selected and their task explained while the rest of the class are rearranging themselves. The shift to groups and role assignment takes about four minutes.

The teacher hands out problem sheets and monitor sheets. Recorders in each group read aloud the first problem. Students are given four minutes to complete the first math problem, then there is a round of reports from all groups focusing on the process. After discussion of the answer to the problem, students discuss what they noticed about the process: what went well in the course of group problem solving and what they need to work on in terms of working in this type of group. The two roving monitors report they have recorded incidents of constructive disagreement, good involvement, and nonverbal praise. From initial announcement through debriefing, this activity takes one hour of class time.

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School Improvement Research Series

Effective Practices in Place: Snapshot #8

Monitoring and Reinforcing Learning: Westmoreland Elementary School Harrisburg High School

Kathleen Cotton

Research Findings

Close monitoring and reinforcement of students' learning progress is positively related to their achievement, according to the effective schooling research. As outlined in *Effective Schooling Practices: A Research Synthesis* (Northwest Regional Educational Laboratory, 1984), the elements of monitoring and reinforcement shown to promote positive learning outcomes include the following:

At the **classroom** level:

1.5 Learning progress is monitored closely.

- Teachers frequently monitor student learning, both formally and informally.
- Teachers require that students be accountable for their academic work.
- Routine assessment procedures make checking student progress easier. Students hear results quickly; reports to students are simple and clear to help them understand and correct errors; reports are tied to learning objectives.
- Teachers use assessment results not only to evaluate students but also for instructional diagnosis and to find out if teaching methods are working.

1.12 Incentives and rewards for students are used to promote excellence.

- Excellence is defined by objective standards, not by peer comparison. Systems are set up in the classroom for frequent and consistent rewards to students for academic achievement and excellent behavior. Rewards are appropriate to the developmental level of students.
- All students know about the rewards and what they need to do to get them. Rewards are chosen because they appeal to students.
- Rewards are related to specific student achievements. Some rewards may be presented publicly; some should be immediately presented, while others delayed to teach persistence.
- Parents are told about student successes and requested to help students keep working toward excellence.

Situation

Westmoreland Elementary School is one of 38 schools in the Eugene, Oregon School District, a large district serving 17,600 students. The student population in the Eugene district is predominantly white; black, Asian, and Hispanic students together only comprise five

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percent. According to the 1980 census, the median family income in the district was $21,838, with the majority of the population working in agriculture, wood products and retailing. Eugene is the home of the University of Oregon, a community college, a private college, and several business schools; and a large percentage of the population also works for these educational institutions. Westmoreland Elementary is a K-5 school with 282 students.

Harrisburg, Oregon is a small, rural community approximately 20 miles from Eugene. Much of the population of 1,600 is employed in farming or in the wood products industry, and income levels are low to moderate. Harrisburg Union High School District 5-J is a one-school district. Harrisburg High is a four-year school with 182 students.

Context: Westmoreland Elementary School

One instructional approach which is especially concerned with all aspects of monitoring and reinforcing student learning is the Direct Instruction System for Teaching Reading and Arithmetic (DISTAR). Program development and technical assistance regarding the DISTAR programs is conducted by the Direct Instruction Follow Through Program in Eugene. Follow Through staff provided NWREL School Improvement staff with recommendations of teachers in the Eugene district with whom they had worked and who they believed to be especially skilled in monitoring students' learning and providing reinforcement.

We wished to observe and write about classroom monitoring/reinforcement from a more general perspective than that of DISTAR or any other specific instructional approach. Therefore, although the first grade teacher observed in preparation for this report is trained in the use of the DISTAR programs, she was not using a formal Direct Instruction methodology during the time of the observation. Instead, her monitoring and reinforcement practices were a combination of methods used in the DISTAR programs and more general monitoring/reinforcement techniques appropriate to the kinds of lessons conducted during the observation.

For more information, contact Pat Bauer, Westmoreland Elementary School, 1717 City View Street, Eugene, Oregon 97502-3499, (503) 687-3373.

Practice: Monitoring and Reinforcing Learning in a First Grade Classroom

On the afternoon of the observation, the class of 23 first graders engaged in:

- A "special person" activity (The rotating honor of "special person" is intended to strengthen personal identity and build self-esteem.)
- A math lesson, game, and seatwork activity
- A discussion of Thanksgiving, followed by listening to the teacher read a Thanksgiving story and a discussion of "what I am thankful for"
- An art activity with a language arts emphasis

The classroom has two-person work tables arranged in two concentric semicircles and space at the front for activities that call for sitting on the floor.

The teacher brought the children in from the playground. A full-time aide who works one-to-one with an orthopedically impaired girl brought that child into the classroom. The teacher asked the children to sit on the floor in the front of the classroom for "special person" time. The boy who was the special person of the week sat in a chair with the other children around him. The teacher asked the children to raise their hands and tell the special boy things about him that they like. While this activity proceeded, the teached worked at maintaining order by calling attention to the behavior of children who were behaving *appropriately*. She continued throughout the afternoon with this practice of "catching children being good," identifying

them by name, and commenting positively on their behavior, e.g., "Greg is my supergood listener"; "Jenny sure knows how to follow directions"; "Watch while Billy walks up to the table and puts the papers away." The teacher exhibited an upbeat and enthusiastic manner to which the children appeared very responsive.

A smooth and rapid transition to the next activity--an explanation of a math game--followed the special person activity. The teacher held the children's attention and began her explanation while gathering math game materials and arranging them on the floor for a demonstration. As she explained and demonstrated the "Ten Dollar Bill Game," she followed each major point with a question intended to check children's understanding. The questions often called for a choral response, but were sometimes directed to particular children.

When she was satisfied that the children understood the game, she gave them directions for gathering manipulative materials for a math activity and asked them to take their seats — again calling attention to the children who were following directions, being quiet, etc.

To convey the concept that thirteen is ten-and-three, sixteen is ten-and-six, and so on, the teacher took the children through a series of exercises using cubes with numbers on their sides. The exercise required that the children both answer verbally and display answers using the cubes. Again, both choral and individual responses were given. The teacher consistently gave positive verbal reinforcement to students who answered correctly, speaking to them (or about them) by name and frequently touching them.

Moving about the room, counting aloud with children, checking their answers as displayed on the cubes, and checking individual understanding of the "ten-and ___" concept, the teacher quickly determined which children were slow in arriving at correct answers and worked closely with them. When helping children individually during this and other activities, the teacher came down to the child's level by squatting down or sitting on a child-size chair.

Children were then given a brief seatwork activity. The teacher passed out worksheets while guiding children through the process of putting the math cubes away, so that materials were ready by the time children returned to their seats. She moved around the room checking students' work and helping them as needed. The students were to begin playing the math game when they finished and turned in their worksheets. The teacher responded to those who were slower in completing their worksheets with encouraging comments such as, "You got the first part finished. Good! Now let's work on the next part." The teacher moved around the room and answered questions during the math game.

A class discussion followed regarding the first Thanksgiving and the way that modern day Thanksgiving holidays are celebrated. The teacher asked questions which elicited a combination of accurate responses and some very strange and creative ones. She responded with enthusiastic and positive verbal reinforcement for correct answers, and when answers were inaccurate (e.g., "the Indians killed the pilgrims"), she made supportive comments, such as "Let's see what our Thanksgiving story will say about that. Maybe we'll find out we're right, and maybe we'll learn something new."

The teacher read a story about the first Thanksgiving, explaining difficult words and asking questions to check understanding as she went along. She read fairly rapidly and with quite a lot of emotion, keeping the children focused by asides such as, "Sarah, do you know that ..." (story narrative) and "Then, Greg, guess what? The pilgrims ..." (more narrative). The activity concluded with the teacher eliciting from the children a list of things for which they are thankful and writing these on the chalkboard.

This became the lead-in for an art/language arts activity in which children cut out a picture of a turkey and wrote on each turkey tailfeather an item from the list of things for which they are thankful. This activity was highly interactive, with the teacher moving about the room checking children's work, answering questions, and giving help and encouragement to students experiencing difficulty.

The school day ended with the teacher guiding the children through cleaning up and, finally, with listening to the principal announce good

citizenship awards for the week over the loudspeaker. Awards were also given out in the classroom, and the teacher encouraged children to share these with their parents.

Several general features of this teacher's monitoring style are especially worthy of note. While the primary focus here is monitoring students' *learning*, it is worth remarking that the teacher is very effective at monitoring students' *behavior* and keeping them on task, as well as monitoring their learning progress.

This teacher's approach to monitoring, as exhibited during the observation, is very much in keeping with the research on effective monitoring and reinforcement practices. She was very positive, focusing on children's successes and finding areas of achievement or improvement to comment on for those students who were having difficulty. In fact, she did not find it necessary to use the word "no" during the entire afternoon; rather, she consistently identified and commented on something positive in children's work or behavior.

Skill in keeping track of students' understanding of the material presented was evident. While maintaining a brisk instructional pace, the teacher managed to note each student's responses to questions and problems and to clarify/reteach before moving on to the next item. During instruction, each major point was immediately followed by a question, e.g., "So we counted ten-and-six bees on the flowers. How many bees did we count?"

Reinforcement of correct responses and appropriate behavior was a constant part of classroom activities. This reinforcement was personalized by speaking students names and touching them. In addition, the reason for the praise or other reinforcement was always clearly specified, e.g., "James, I heard you thank Suzanne for giving you the scissors; I like that," or "Paula knows that there are ten-and-five kittens in the picture. Watch her hold up her number cubes for ten-and-five."

Finally, the pace of instruction and the attentiveness of the teacher insured that the children received immediate feedback/reinforcement regarding their learning, on-task behavior, and social behavior. Thus, the inadvertent reinforcement of misunderstandings or negative behavior that sometimes results from failure to notice and address problems was avoided. Instead, children were constantly given the message that they and their learning are important and noticed.

Context: Harrisburg High School

Five years ago, before the present Wood Technology Program instructor joined the Harrisburg faculty, the program was not a particularly successful one. There was no regular shop instructor; teachers of other subjects took turns filling in. The learning atmosphere was rigid, with tools and materials under lock and key. There was little or no reinforcement of basic skills, and the program was not a popular one; fewer than thirty students participated annually.

Then, under the direction of a new district superintendent/high school principal, an effort was launched to upgrade the quality of all the school's programs. As part of this effort, the present wood shop instructor was hired and has since instituted many changes in the program. As the program is currently operated:

- More and more modern equipment has been acquired and is in use.
- The instructor promotes the program to students, teachers, and parents; current enrollment is approximately seventy students, including nine girls.
- The instructor solicits and acquires pallets and other free wood from local businesses, which keeps costs down, enabling students to carry out projects they could not otherwise afford.
- Under the instructor's direction, advanced students refurbish travel trailers and build boats; the proceeds from these activities have made the wood shop program almost entirely self-supporting.
- Tools are hung on the wall so as to be constantly available for use; there have been no thefts in four years.

- The instructor has established good rapport with students and handles all discipline problems without referring students to the principal's office.

- Competence and safety in using woodworking machinery are constantly emphasized; there have been no accidents since the present instructor took charge of the program.

- The first nine weeks of the beginning woodshop class are devoted to classroom instruction. Students study woodworking manuals; learn how to determine materials needs and costs for projects; and are introduced to the various kinds of woodworking machines, their uses, and safe operation.

- The instructor has developed a mathematics workbook for use by students in the advanced building construction class. These students receive a math credit for their mastery of the material in the workbook.

- The instructor is committed to the goal of having all students experience success. Many students (including some special education and behaviorally disordered students) who have not succeeded in other classes have experienced improvements in basic skills and behavior as they are guided to successful completion of woodworking projects.

The wood technology shop space is modern, roomy, and well-equipped. In addition, the program makes use of a conventional classroom in which students learn woodworking basics using program manuals, compute materials needs and costs, and carry out other paper and pencil activities.

More information is available from Jack Carroll, Wood Technology Program Instructor, Harrisburg High School, 400 S. 9th Street, Harrisburg, Oregon 97446, (503) 995-6626.

Practice: Monitoring/Reinforcement in a Secondary Wood Shop Class

School Improvement Program staff observed a beginning woodworking class with 18 students and an advanced class where, due to absences and recent transfers, there were only five students.

At the beginning of each class, students entered the classroom and the instructor read announcements. He then checked with each student about what he or she was planning to do in class that day. Students who were between projects agreed to help others. By the time students left the classroom and entered the shop area, the instructor had clarified with everyone what he or she was to be doing. As part of his opening comments, the instructor noted a couple of problems — a hole drilled recently in a workbench and finish being sanded off one of the benches. He reminded students to be careful and quickly reviewed guidelines for the use of the tools. His manner was positive — nonaccusing and nonthreatening.

Several of the students in the beginning class were making gun racks or towel racks. As they worked, the instructor moved around the room, checking their projects and offering suggestions. He was also frequently approached by students with questions. Using words, gestures, manuals, and his own drawings, the instructor assisted students — often beginning a step by way of demonstration, but always turning the project back to the student as soon as he had explained what to do. When students demonstrated understanding, the instructor enthusiastically acknowledged this and encouraged them to carry on. Watching students who had just received help, it was obvious that the explanations/demonstrations had been effective: they proceeded with confidence on the next step of their projects.

There was no off-task behavior observed in either class. Even when students needed help and had to wait their turn to talk with the instructor, they were attentive to what he was saying.

The instructor's manner in dealing with students was very supportive and nonpatronizing. His demonstrations involved frequent eye contact with students and checking to make certain they were understanding him. A supportive hand on a student's shoulder while reviewing a drawing or explaining a detail contributed to the positive and encouraging atmosphere.

Researchers consistently note that effective monitoring and reinforcement are grounded in teachers' awareness of what is going on in their classrooms. The shop instructor exhibited this "with-it-ness". While most of his moving around the classroom was methodical and matter-of-fact, he was quick to notice and respond if students were doing anything that might pose a safety hazard or result in their project materials being damaged.

The observor approached a number of students, asking them questions about the class: Why did you sign up for it? Did you have woodworking experience before taking classes here? Do you like the class? Does it require much math and reading? In general, the students said they signed up for the class either because they thought it would be fun or because older students had told them it was a good class. Some students said they wanted to be carpenters or cabinetmakers. Most had had no previous woodworking experience. All said they liked the class, and some volunteered that it was their favorite class. All said that they have to use their math and reading skills a lot, and some went on to describe the specific activities requiring these skills.

Students were not asked specifically whether they like the instructor, but several said that they did. As one boy put it, "He makes you work hard, but he's a real good teacher."

Monitoring and reinforcing the learning progress of first graders acquiring basic skills differs greatly, of course, from the way monitoring and reinforcement are carried out in a secondary shop class. Still, it appears that there are some constants which can be observed in both kinds of settings. Both teachers, for example, had a high degree of awareness of what was going on in their classrooms. No students were ignored or allowed to be disruptive or otherwise off-task. Both teachers moved about their classrooms, checking students work and responding to questions. Both were extremely positive in their interactions with students, encouraging them, conveying confidence in their abilities, and finding accomplishments or improvements to note and reinforce. Both used a variety of methods to keep track of students' understanding/mastery of instruction — choral response, individual response, checking seatwork or benchwork, inviting questions, having students give physical demonstrations of understanding — in addition to the more formal kinds of recordkeeping and assessment which are not apparent in brief observations such as these. Finally, both teachers conveyed affection and respect for the students and enthusiasm about their learning. Not surprisingly, the students — big and little —responded with positive attitudes and motivation to learn.

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School Improvement Research Series

Special Report

Summary of Research on Class Size

Kathleen Cotton

Introduction

The relationship between class size and educational outcomes has been a controversial and much investigated subject. Fortunately, however, analyses of the various kinds of class size research conducted over the past ten years have led to several generally accepted conclusions about the class size-student outcomes relationship. Even in cases where researchers have challenged one another's methodological approaches, their conclusions have been similar enough to permit reasonable certainty about the impact of class size on student achievement, behavior, and other outcomes.

Support materials for the assertions outlined below include reviews and analyses which encompass most of the class size research studies conducted since 1950. In particular, the conclusions offered are drawn from meta-analyses by Gene B. Glass and Mary L. Smith and from research summaries conducted by staff of the Educational Research Service, Inc. (see the references). Some studies representing trends which have begun since these large-scale summaries were published are also included.

The Class Size Research

I. **General Conclusions**

A. There is no "optimum" class size covering all types of students, in all subject areas, and at all grade levels.

B. Smaller classes will not, in and of themselves, result in greater achievement for pupils.

II. **Class Size and Grade Levels**

A. Smaller classes are related to higher achievement in the primary grades of kindergarten through grade three.

B. Smaller classes tend to have a slight positive effect on student achievement in grades four through eight, but the evidence is not nearly so strong as in the early primary grades.

C. Research does not indicate that smaller classes have positive effects on the achievement of students in grades nine through twelve.

D. For grades kindergarten through three and four through eight, the most beneficial effects are noted when the class size is 22 students or less.

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III. Class Size and Content Areas

A. The most beneficial effects of smaller classes are noted in the area of reading followed, in descending order, by mathematics, language arts, and natural sciences.

B. About a third of the research studies concerned with other areas found greater achievement in smaller classes.

IV. Class Size and Student Characteristics

A. Students of lesser academic ability achieve more in smaller classes.

B. Economically disadvantaged students evidence greater achievement in smaller classes.

C. Ethnic minority students have higher achievement in smaller classes.

V. Class Size and Teaching Practices

A. Smaller classes do not guarantee that teachers will adapt their teaching practices to take advantage of the smaller class situation.

B. Research emphasizes the importance of high-quality teaching if small classes are to produce achievement benefits.

C. Teachers in small classes tend to use more desirable teaching practices than teachers in large classes, e.g.:
   1. Greater variety of instructional techniques
   2. More attention to individual students
   3. More individualization of instruction.

VI. Instructional Methods and Learning Interventions

While class size does bear some positive relationship to achievement, other factors appear more important, e.g.:

A. Reinforcement, acceleration, reading training, and cues and feedback/correctives have been found to have greater positive effects on achievement than class size.

B. Peer tutoring has been found to be over four times as effective in improving students' mathematical and reading achievement than reducing class size from 35 to 20.

VII. Class Size and Student Behavior/Attitudes

A. Smaller classes have positive effects on the behavior and attitudes of students in grades kindergarten through three.

B. Research is limited regarding effects on older students, but it appears that class size does not affect behavior/attitudes of these students.

VII. Teacher and Public Opinion Regarding Class Size

A. Teachers overwhelmingly prefer small classes.

B. Teachers view large classes as a serious problem, negatively affecting the academic performance, personal development, and social development of their students.

C. Parents and other members of society see smaller classes as beneficial to student achievement.

IX. Cost Implications of Class Size

A. Research on cost implications is limited in scope, and researchers claim that the methodologies used oversimplify and omit important variables.

B. It appears that the use of peer tutors can be more cost effective in increasing student achievement than reducing class size.

References

Bain, H. P., and Achilles, C. M. "Interesting Developments on Class Size." *Phi Delta Kappan* 67 (1986): 662-665.

Reviews findings of research conducted on projects to reduce class size in the primary grades in Indiana and Tennessee. Results indicate that these radical class size reductions (to between 14 and 18 children) produce greater achievement, reduce behavioral problems, and enable teachers to become more productive and efficient.

Cotton, K., and Savard, W. G. *Class Size: Topic Summary Report*. Portland, OR: Northwest Regional Educational Laboratory, 1980.

Reviews 20 studies and reviews on the relationship between class size and student outcomes. Findings include that there is no optimal class size for all instructional situations and that smaller classes are beneficial to primary, low-ability, disadvantaged, and special education students.

Educational Research Service, Inc. *Class Size Research: A Critique of Recent Meta-analyses*. Arlington, VA: Educational Research Service, Inc., 1980.

Offers a critique of two class size meta-analyses conducted by Smith and Glass in 1978 and 1979. Focuses on methodological problems in the meta-analyses rather than conclusions from the class size research.

Glass, G. V., and Smith, M. L. *Meta-analysis of Research on the Relationship of Class Size and Achievement*. San Francisco: Far West Laboratory for Educational Research and Development, September 1978.

Reports the findings from a meta-analysis of 77 studies of the class size-achievement relationship. Found that, as class size increases, achievement decreases. Very small advantages were noted when reductions were made in the 20-30 student range, and large advantages when class size was reduced below 20.

Klein, K. "The Research on Class Size." *Phi Delta Kappan* 66 (1985): 578-580.

Reports findings from several major class size studies conducted during the ten years prior to the review. Special attention is given to the 1978 Glass and Smith study and field studies conducted by the Ontario Ministry of Education. The review focuses on research regarding small group instruction within classes as well as research comparing smaller and larger classes. The reviewer focuses on achievement, behavior, and time-on-task outcomes.

Robinson, G. E., and Wittebols, J. H. *Class Size Research: A Related Cluster Analysis for Decision Making. ERS Research Brief.* Arlington, VA: Educational Research Service, Inc., 1986.

Summarizes 100 research studies conducted between 1950 and 1985 and uses a clustering approach to group and regroup the studies into eighteen major areas of concern, e.g., effects of class size on achievement by grade level and by subject area, effects of class size on affective outcomes, etc. Conclusions are offered for each of the 18 areas.

Smith, M. L., and Glass, G. V. *Relationship of Class Size to Classroom Processes, Teacher Satisfaction, and Pupil Affect: A Meta-analysis*. San Francisco: Far West Laboratory for Educational Research and Development, July 1979.

Reports on the application of a refined meta-analysis technique to 60 of the 77 studies on class size examined in the authors' 1978 meta-analysis. On all measures, reduction in class size was associated with higher-quality schooling and more positive attitudes. These outcomes were most notable for children twelve years old and younger, and least apparent for students eighteen and over.

Swan, E.; Stone, W.; and Gilman, D. A. "The Educational Effects of a State Supported Reduced Class Size Program." *EPS Spectrum* 5 (1987): 20-23.

Reports the results of a study on the effects of reducing class in first and second grades over a three-year period. First grade classes were reduced from an average of 23.7 to 16.1. In the second grade classes were reduced from 20.5 to 17.4 students. Significant improvements were noted between years one and two, but further class size reduction (below 20 students) made no difference.

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